Volume XIII.
Number 5.

NOVEMBER, 1897.

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TEXTILE WORLD.

With which is Incorporated the

INDUSTRIAL RECORD

The Textile World's Complete Directory of Textile Establishments, the Mill Trade and of Large Buyers of Textile Fabrics is now ready for delivery. 360 pages, with 19 textile maps.

	PAGE
Portrait and Sketch of Chas. A. Stott	25
When the Tariff became Operative	27
Judge Lawrence and the Tariff	28
A Great Manufacturing Stream	30
The Cylindrical Cotton Bale	30
Textile School at Paterson	31
Water Powers of Georgia	32
Limbless Cotton Plant	33
Negro Operatives	33
New Eng. Cotton Manufacturers' Association—Autumnal Meeting	34
Wool Clip of 1897	45
The Limbless Cotton Plant	46
Cotton Manufacturing in Russia	48
Style Suggestions for Woolens	52
Dry Goods Trade of New York	53
Wool and Cotton Markets	55
Cotton Department	56
Woolen Department	62
Knitting Department	81
Power Department	86
Dyeing Department	91
Yarn Department	129
Questions and Answers	97
New Publications	99
Industrial News	101
Mill News	103
Personals	109
Situations Wanted	121
Mills, Machinery and Specials	125
Textile Patents	27
Recent Sales of Mill Shares	99
The Textile World's Directory	127

Classified Index for Buyers, - - Page 113.
Alphabetical Index to Advertisements, " 119.

GUILD & LORD, Publishers, 620 Atlantic Avenue, Boston, Mass.

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PROVIDENCE, R. I.

Bleaching, Dyeing, Drying and Finishing Machinery.

Cotton, Paper and Husk Rolls.

TENTERING MACHINES

With Patent Self-Feeding Clips.

Patent Combination Rolls

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Calenders, Mangles, Drying Machines, Tentering Machines, Hydraulic Presses, Etc.

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Short and Long Chain Dyeing, Sizing and Drying Machines.

PATENT

OIL, COMBINED "PLATE and FLAME"

SINGEING MACHINES.

H. W. Butterworth & Sons Co.,

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Tentering Machines

VIBRATORY

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— FOR ALL KINDS OF —

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Patent Automatic Clamp, Spring Clamp, Pin Chain.

SPECIAL.

Tentering Machines with Adjustable Eccentric (Patent applied for) for imparting vibrating motion.

The above gives a uniformly smooth motion and the finish obtained on goods is of a superior character.

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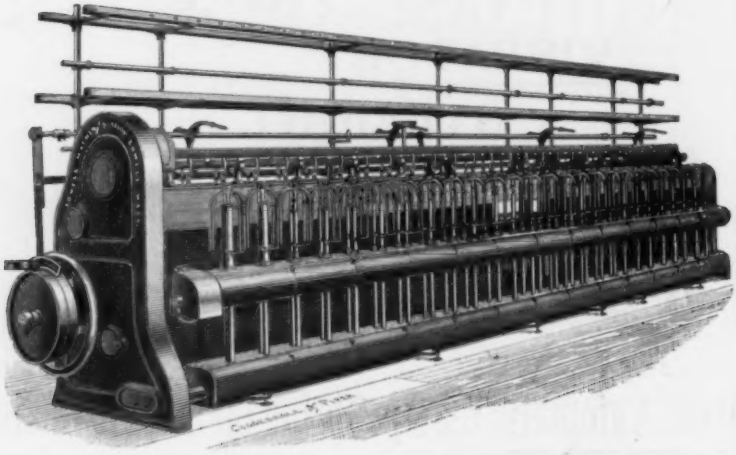
OF EVERY DESCRIPTION.



Revolving Flat Cards, Railway Heads,
Ring Spinning Frames, Fly Frames,
Drawing Frames, Spoolers, Warpers,
Slashers, Looms.

Complete Equipment for Cotton Mills.

ILLUSTRATED CATALOGUES SENT ON APPLICATION.

Consideration

OF THE

Northrop . . Loom

Involves comparison with former similar innovations.

It is more expensive — yes, and so is the plain power loom more costly than the hand loom which it displaced.

Why not return to hand looms and get a cheap equipment also giving more laborers employment? The conservative should be more consistent.

Why do mills that have adopted our High Speed Spindles hesitate about using this loom? It will save them more than the entire cost of the spinning on which our spindles only gained a fraction.

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Revolving Flat Carding Engines,
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Wet and Dry Twisters,
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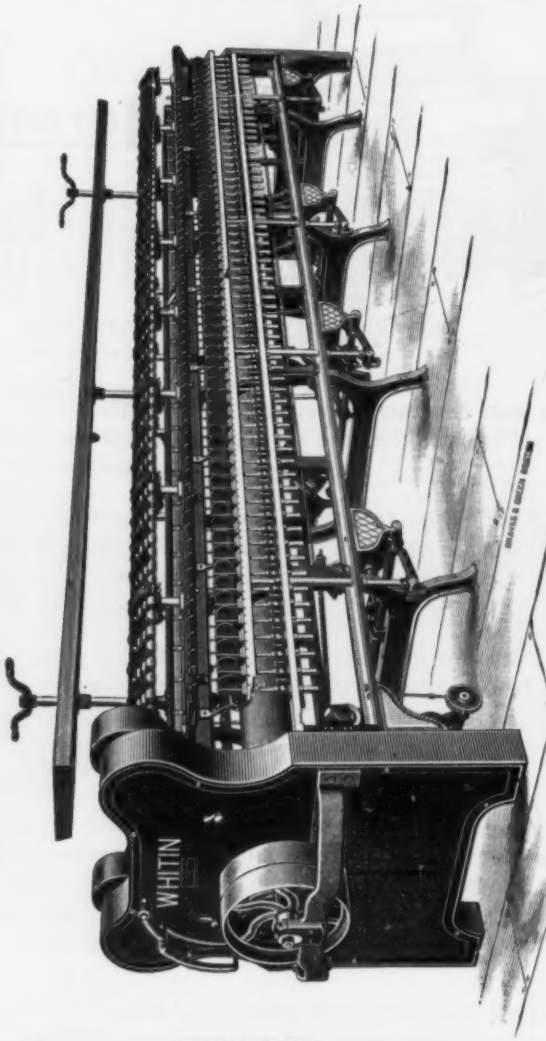

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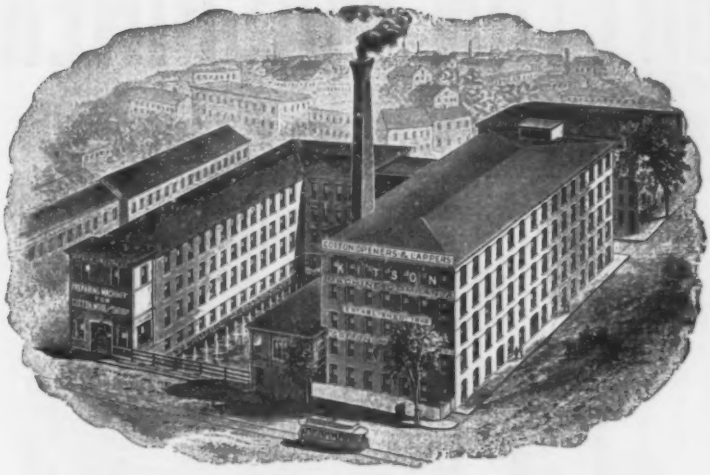
Won't Do!



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are always the

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MASON MACHINE WORKS,

TAUNTON, MASS.

COTTON MACHINERY

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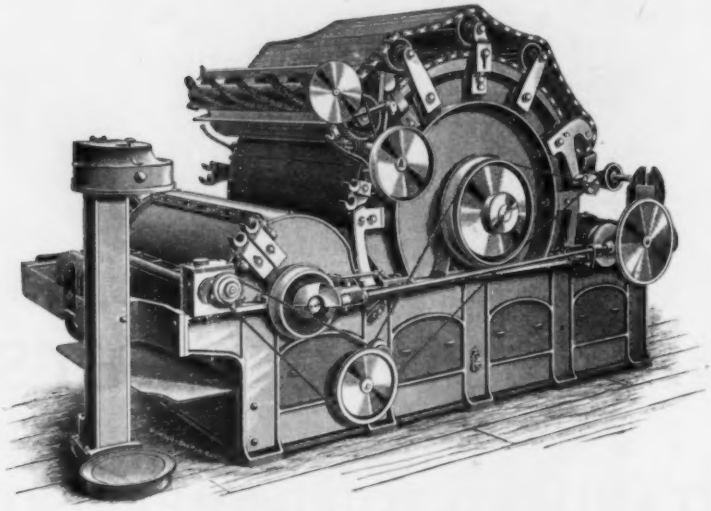

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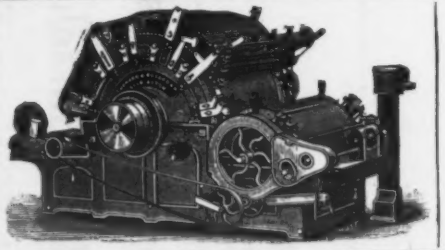
The Celebrated FALL RIVER IRON WORKS CO., one of the largest cotton mill plants in the world, is entirely equipped with our spinning and weaving. It has 262,416 SPINDLES of our PATENT SPINNING FRAMES and 7,469 of our LOOMS.



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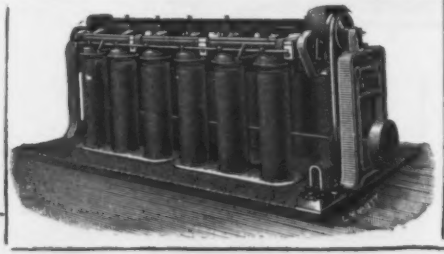
The Simplest and Most Accurate. Greatest Production. Best Quality. Least Waste.

Electric Stop-Motion Drawing.

The quality of the sliver produced cannot be surpassed. Waste, "single" and roller laps are prevented, production increased, and great saving effected.



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All made from entirely new patterns and containing many valuable patented improvements.

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New patented Differential motion, New Arrangement of Cone Drums, New System of Balancing top or bobbin rail, etc.

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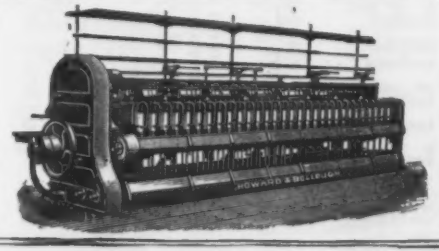

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for WOOL, SHODDY, and COTTON, is

Second to None

on the market. It holds more stock, requires less space, and needs no "attachments."

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Spinners of Worsted Yarns. Mixes and Fast Colors Specialties.
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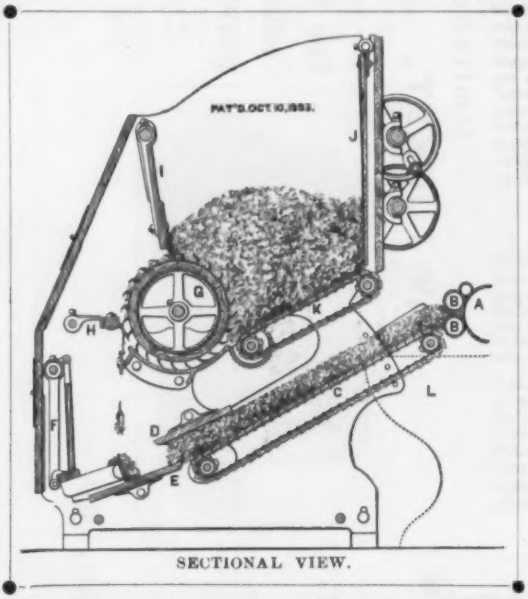

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THE FISHER CARD FEED is simple in construction, is strongly built, turns out even work, requires little changing, and feeds the same whether full or nearly empty.

It is built in all sizes and guaranteed as represented.

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Worsted Yarns.

C. T. Crocker, Pres. C. B. Smith, Treas.

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Yours respectfully, STAR WORSTED COMPANY,
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Builders of every variety of

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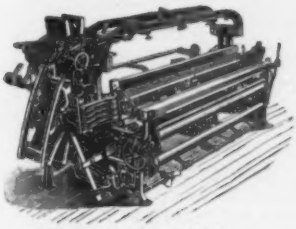
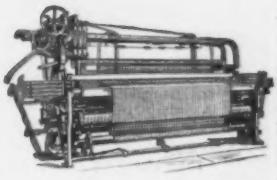
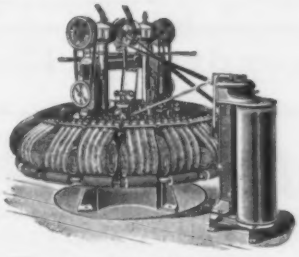


Crompton "1896"
Woolen and Worsted Loom.



Knowles Heavy Worsted Loom.

Wool



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For Combing

COARSE
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THE LATEST AND BEST LOOMS AND HARNESS MOTIONS

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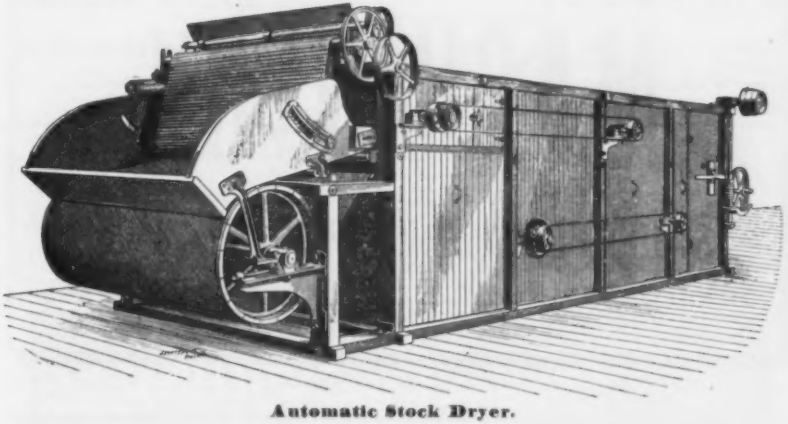

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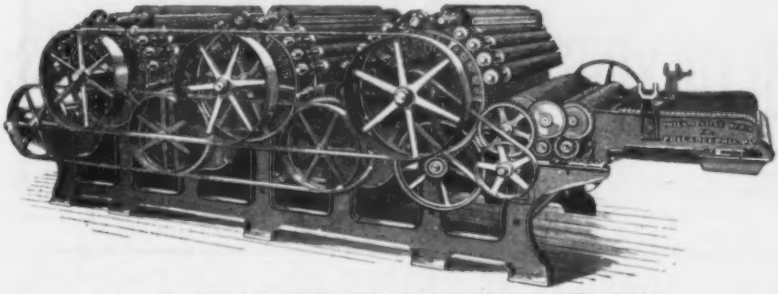

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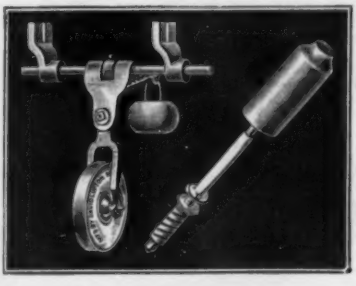

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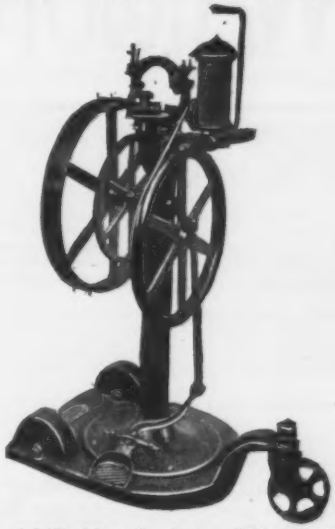

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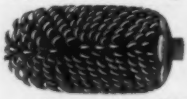
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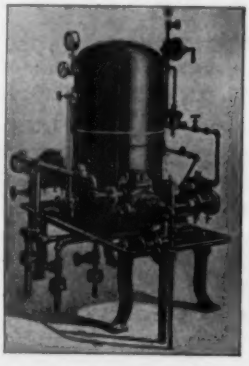
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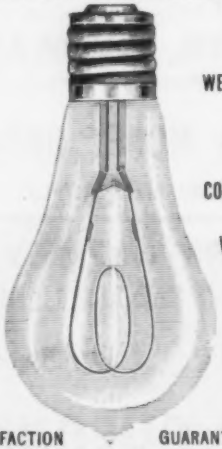

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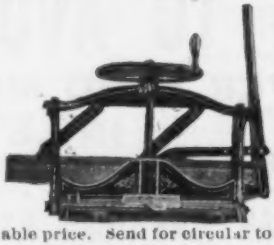

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Carding Machines, Protecting Cover for. 590,310. W. E. Sharples and F. J. Snell, Fall River, Mass.

Coloring Yarns, Method of and Apparatus for. 590,547. C. L. Horack, Brooklyn, N. Y.

Cotton Chopper and Cultivator. 591,116. B. L. Hargrove, McLendons, Tex.

Cotton Gin. 590,682. J. H. Heffner, Thornton, Tex.

Cotton Opening Machine Beater. 590,560. A. F. Atherton, Warwick, R. I.

Cotton Press. 591,304. Magnus Swenson, Chicago, Ill., assignor to the American Cotton Co., New York City.

Cotton Press. 591,344. F. L. Dyer, Washington, D. C., assignor to American Cotton Co., New York City.

Drawing Rolls of Cotton Machinery, Clearer for. 590,920. J. Thomson, Jr., Pawtucket, R. I.

Dye, Red. 591,309. Jules Ville, Montpellier, France.

Dye, Trisazo. 591,616. M. Boniger, assignor to Chemische Fabrik, vormals Sandoz, Basle, Switzerland.

Fabrics, Joining Edges of Previously waxed. 591,299. Wm. W. Simonson, Cincinnati, O., assignor to C. C. Mitchell & Co., same place.

Fabrics, Ornamenting or Decorating. 590,457. J. Lancaster and C. Witteck, New York City.

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Knit Goods. 591,128. Wm. Esty, Laconia, N. H.

Knitting Machine. 591,199. W. Stafford, Little Falls, N. Y.

Knitting Machine, Circular. 591,213. J. C. Egly, Philadelphia, Pa.

Loom. 591,734. B. Bosse, Barmen, assignor to Biernatzki & Co., Hamburg, Germany.

Loom Shuttle Box Operating Mechanism. 590,383. H. Bardsley, Providence, R. I., assignor to Knowles Loom Works, Worcester, Mass.

Loom Shuttle Box Operating Mechanism. 591,308. Paolo Vigno, Triuggio, Italy.

Loom Shuttle, Self Threading. 591,370. Geo. O. Draper, Hopedale, Mass., assignor to Geo. Draper & Sons, same place.

Loom Warp Stop Motion. 590,551. J. H. Northrop, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

Printing Fabrics. 590,245. George Stokes, assignor to himself, G. F. Tolley, Philadelphia, and J. Magee 2nd, Bloomsburg, Pa.

Spindle. 590,260. A. Gartner, Paterson, N. J., assignor to Draper Co., Portland, Me.

Spindle. 590,381; 590,382; 590,377; 590,378; 590,379; 590,380. C. Sheld, Harrison, N. J., assignor to Draper Co., Portland, Me.

Spindle Bearing. 590,314; 590,315; 590,317; 590,318; 590,319; 590,320; 590,322; 590,323. John Kilburn, Belmont, Mass.

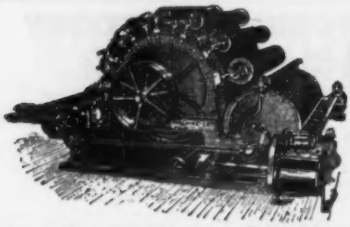
Spindle Support. 590,316; 590,321. John Kilburn, Belmont, Mass.

Spinning Machine Spindle. 591,054. L. A. O. Nichol and E. Ayotte, Lowell, Mass.

Thread Severing Attachment for spools. 591,592. W. H. Earle, Providence, R. I.

Twisting Machine. 590,827. E. and R. Dawes, Philadelphia, Pa.

Twisting and Winding Machine. 590,824. R. Dawes, assignor of two-thirds to E. Dawes, Philadelphia, Pa., and E. H. Haskell, Boston, Mass.



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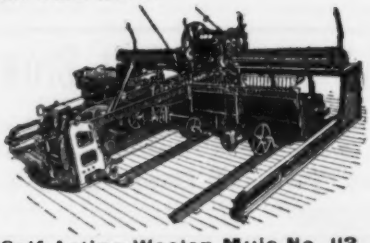

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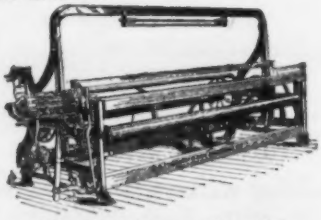

Blanket Loom No. 128.

—Gold is coming to the United States in payment for the large wheat exports that have been going on for the last number of months. This will continue for some time, no doubt, and will be felt in all branches of business and stimulate trade prosperity in all industries. The labor strikes in the coal mining districts of Pennsylvania are now practically at an end. The cause of these labor strikes that occur with frequency in the mining districts are not wholly due to the turbulent spirit of the employees. The employers have much to answer for.

—Any person or corporation engaged in manufacturing, which requires from persons in his or its employ, under penalty of forfeiture of a part of the wages earned by them, a notice of intention to leave such employ, shall be liable to the payment of a like forfeiture if he or it discharges without similar notice a person in such employ except for incapacity or misconduct, unless in case of a general suspension of labor in his or its shop or factory:—[Mass. Law.

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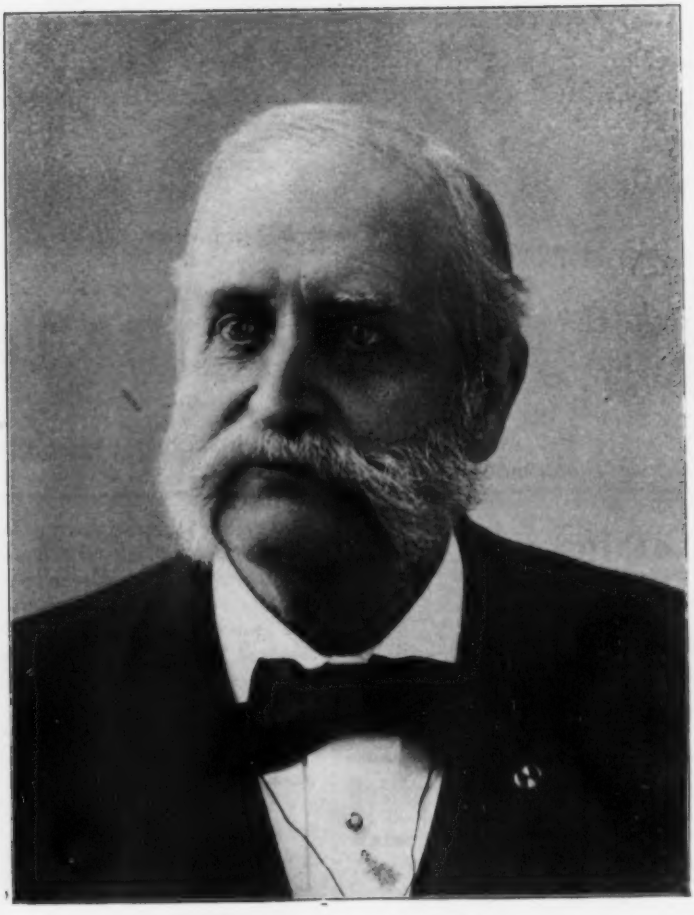
—One of the most important devices that is to be seen at the Lowell Textile School, Lowell, Mass., is the self-acting balling machine attached to the wool cards furnished by the Torrance Manufacturing Co., Harrison, N. J. Those visiting the school should not pass it unnoticed.



CHARLES ADAMS STOTT.

TEXTILE WORLD.

Vol. XIII. NOVEMBER, 1897. No. 5.

CHARLES A. STOTT.

Hon. Charles Adams Stott, familiarly and most pleasantly known by his friends as Major Stott, is descended from an English ancestry, and has been in the public service more or less for the last thirty years, having served his country as major of the 6th Mass. Volunteers, 1862-63; his State as a member of the House of Representatives, in 1867; his city as a member of both branches of the city government, and mayor, in 1876-77. He was born in Lowell, Mass., August 18, 1835, and was the only child of Charles and Sarah MacAdams Stott.

Charles Stott was born at Rochdale, Lancashire, England. As his parents were in humble circumstances, he was put to work at an early age in a woolen mill, but when he attained manhood, his ambition prompted him to leave the ranks of the day laborer to begin business on his own account; but, as fortune did not smile upon him in England, he migrated at the age of 27 to America, landing in Boston in 1826, with two English shillings in his pocket—his only riches. One of these pieces he kept through life as a souvenir of his early struggle. It still remains in the hands of his son. He found his first employment in this country in a woolen mill at Andover, Mass. In 1828, with three associates, he began to operate the Navy Yard Mills, in Dracut, Mass., of which Robert Middleton, whose portrait appeared in our last month's issue, was at one time superintendent. In 1835, he became agent of the Belvidere Woolen Mills, of which he became part owner in 1850, with Walter Farnsworth. In 1853, the mills passed into a corporation under the name of the Belvidere Woolen Manufacturing Co., with a capital of $200,000, with Mr. Chas. Stott as president and active manager, under whose sagacious and energetic control the enterprise was crowned with remarkable success. Mr Stott retained the management of mills owned by the corporation until his death, in 1881, at the age of 82 years. Mr. Stott was a man of marked individuality, and from a penniless young man he rose, by persistent industry and great energy, and strict economy, to wealth, leaving behind him an honored name.

Charles A. Stott, the subject of this sketch, received his education in the public schools of Lowell, graduating from the high school. His first occupation was in a hardware store, then for one year as clerk in the counting room of the Merrimack Manufacturing Co., Lowell, whence he went to the Belvidere Woolen Mills, in the same city, in 1856, as clerk and paymaster under his father, who was a large owner in the mill as noted above. He occupied this position until his father's death, in 1882, when he succeeded him as agent and treasurer, which position he still holds.

Major Stott was married first to Mary E., daughter of George W. Bean, of Lowell, who died in 1860; and, in 1863, he married Lizzie Williams, daughter of Willard and Sarah Williams, of Concord, N. H.

Major Stott is a prominent member of the Masonic fraternity, with which he has been connected for forty years. He is now affiliated with Kilumning Lodge, Mt. Horeb Royal Arch Chapter, Ahasuerus Council, and Pilgrim Commandery of Lowell, Massachusetts Consistory, thirty-second degree. Past-Commander of Pilgrim Commandery,

and Past Grand Commander of the Grand Commandery Knights Templar of Massachusetts and Rhode Island; also member of Massachusetts Commandery Loyal Legion, Post 42 G. A. R., a member of the Lowell Board of Trade, and of the National Association of Wool Manufacturers, president of the Home Market Club, Boston, director in both the Prescott National Bank and Lowell Mutual Fire Insurance Company, and president of the Lowell Cemetery Corporation.

His interest in the welfare of his army comrades has been fully recognized by their electing him commander of the Post, as well as to other positions of honor and responsibility in the Department of Massachusetts. At the dedication of Memorial Hall, Lowell, he was selected by his comrades to voice their gratitude to the city of Lowell for the magnificent memorial they had caused to be erected to the memory of the soldiers and sailors who enlisted in the quota for Lowell during the rebellion. Major Stott has the name of never asking anyone to go where he will not go himself. It is related of him that in the summer of 1862, when in command of Co. H, 6th M. V. M., the call by President Lincoln for troops came, and immediately the officers of the militia regiments tendered their services to the government. A public meeting was held in front of the Market House, Lowell, to encourage enlistments, the Mayor presiding. After many speeches had been made urging the citizens to enlist, Capt. Stott was called upon, and in a voice that could be heard all over the square, he said: "Boys, I do not ask you to go, but to come," and sat down. The regiment was speedily filled and mustered into the service for nine months, with Capt. Stott as its major.

The Major is known as being most happy as a presiding officer, and particularly was this observed in his felicitious introduction of General Howard at the banquet of the Home Market Club, a year ago. At first, he seemed for a moment at a loss just how to get the General upon his feet, and introduce him with an appropriate allusion to his well known Christian character and to his military record. With an apparently sudden inspiration, he gave by name the great battles in which the General had been conspicuous, and said with electrical effect: "Fair Oakes; Chancellorsville; Chicamauga; Atlanta to the Sea, are engraved upon the escutcheon of General Oliver O. Howard, whom I now have the pleasure of presenting to you."

The Belvidere Woolen Mills having played an important part in the history of woolen manufacturing in this country, it seems but proper to refer to their early record somewhat in detail. Thomas Hurd, who began the manufacture of satinets on the Concord River, in 1818, owned the water privilege at the mouth of that river, on both sides. He sold the privilege on the east, or Belvidere side, to Winthrop Howe, who engaged in the manufacture of flannels on the hand loom, who, in 1827, sold it to Harrison G. Howe, who introduced the power loom. In 1832, Mr. Howe sold it to Warren, Barry & Park of Boston, who in 1834, sold it to Whitwell, Bond & Seaver, who, in 1835, sold it to Farnsworth, Baker & Hill. It was under the latter company that the father of Major Stott became connected with these mills. These mills now have sixteen sets of woolen machinery, ninety-two looms, operated by water and steam, in the manufacture of all-wool flannels and dress goods, the annual production being 800,000 yards of the former and one million yards of the latter goods.

The Major, in his social intercourse, is most genial, and his broad experience with men and affairs has developed a personality both pleasing and entertaining. He enjoys the esteem of his fellow citizens, and what is very highly to his honor, he has the affection and respect of those who are in his employ.

—Picking machinery is often abused, crowded to gain laps, in order to get time to open cotton, and stop for high or low water and other purposes. Like other machines, there is a limit to the amount they can do and do well.

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WHEN THE TARIFF BECAME OPERATIVE.

The Board of U. S. General Appraisers reached its decision last month concerning the time when the present tariff went into operation, as we thought it would, and contrary to the position taken by the Treasury Department. The opinion of the Board was written by Gen'l Appraiser Somerville, whose judicial decisions have long been regarded as especially sound, and which have been sustained in similar instances by the Supreme Court, upon appeals made to it. Judge Somerville's opinion is that the tariff act of 1897 did not become operative as a law until six minutes after four o'clock P. M., July 24, 1897; being the time when the Act was approved by the President. Judge Somerville depended largely for his opinion upon section 32 of the Act relating to the imposition of certain additional or penal duties. He recognizes the fact that this section provides that such additional duties shall not be construed to be penal, but this he understands to mean that such duties shall not be interpreted to be penal so as to be subject to remission as penalties under the sections of the revised statutes construed by the attorney general. "It cannot be supposed," he says, "that Congress intended to declare that they shall not be judicially construed as penal, so far as they partake of the nature of an ex-post facto law." This is an important part of Judge Somerville's decision, and upon it turns his conclusions, as will be seen in his further remarks, that "the authorities are uniform in holding that the fiction of the relation of statutes does not apply to penal duties. If the above section be penal, it cannot be construed to be re-troactive for a single moment of the day on which the bill was approved by the President. It would be absurd to construe the penal sections of a law to be operative at one hour of the day and its other parts as in force at another time of the same day. The law is an entirety."

To get at the essence of the decision, the words just quoted should be stud-

ied, for if it can be substantiated that one part of any law is operative at a certain time and not before, the entire law is equally affected. In his determination, the judge paid slight attention to the phraseology of Section 33, in which occurs the words "on and after the day when this act shall go into effect." The contention of the importers was sustained, that, although, ordinarily, it may be the rule that cognizance of fractions of days is not taken, this rule is purely one of convenience, which must give way whenever the rights of a party require it. There is no indivisible unity about a day which forbids it in legal proceedings to be considered in its component hours. The benefit of this decision does not apply to goods that were not formally entered at the custom house, notwithstanding they may have arrived prior to its passage.

Although Judge Somerville has personally favored us with a report of his decision, we fail to discover any reference on his part to the effect of Section 34 of the Act, which we should think had a direct and important bearing upon his conclusions. That section repeals specifically, certain parts of the Act of 1894, and provides that said repeal shall "take effect on and after the passage of this Act." The direct inference of this is that the Act of 1894 was in force in all of its parts until the exact time of the passage or approval of the Act of 1897, which was 4.06 o'clock, P. M., July 24.

JUDGE LAWRENCE AND THE TARIFF.

Judge William Lawrence, of Ohio, president of the National Wool Growers' Association, is not happy over the present wool tariff, and feels that the wool growers of this country have not been properly dealt with, nor received the protection to which they are entitled. He is disposed to admit that the tariff is, in a measure beneficial to farmers in many ways, and helps, for the present, those engaged in sheep husbandry; but he anticipates a decline in the price of wool in the world's markets before many months, and then the tariff will be inadequate. The judge ought to know that no tariff can prevent fluctuations in the market price, and that if the price declines abroad, it will follow suit in this country, and that the only effect that a tariff has upon prices is that it gives the farmer the advantage of the duty in the difference between the foreign and domestic price.

Mr. Lawrence has referred, in much detail, to the defects, according to his views, of the law. "Broken tops," he says "will, of course, come in at the same rate of duty as waste—20c. per pound." There is no good reason for this assertion, and we can assure Mr. Lawrence that there is scarcely any danger of this happening, with proper circumspection in the Appraisers Department of the Custom House. Nothing of this kind is likely to occur, any more than was the case under previous tariffs. Besides this, the present law provides specifically for top waste, at 30c. per pound. If they are broken with the evident purpose of evading the law, they are subject to the General Appraisers' decision 16,086, as a manufacture of wool.

Mr. Lawrence makes one admission which will trouble him, should the question of duty arise upon the importation of common goat's hair. He says that the tariff now allows the admission of this article free of duty. We think that he is right in this interpretation of the law, and in harmony with the intention of Congress. A duty on such a commodity would be absurd, but Mr. Lawrence did his best to get one, and as a fact, he came very near securing it.

Mr. Lawrence speaks of the paragraph imposing a duty on wool on the skin as an ingenious clause that can be taken advantage of in allowing the free importation of such a high priced article as Angora goat's hair on the skin. We see no reason why he should disturb himself about this, as the present law reads like previous ones on this point, and the decisions of the Treasury Department and General Appraisers have been uniform for the last 27 years, in deciding that Angora hair on the skin was subject to the

same duty as wool. We have but to refer him to the decision of the G. A., in 1891 (Synopsis No. 11,385). The duties on wools of the third class never did and never can, probably, please Mr. Lawrence. We agree with him, however, that some duty should be placed upon this class of wool, if a duty is to be imposed upon any class. The fact that it is almost exclusively used for carpets, does not necessarily unfit it for use in the manufacture of fabrics for men's wear, as is the case occasionally, for the lower grades of goods; but, American sheep growers are not disposed, for economical reasons, to go into the raising of wools other than the most improved.

Though the new law permits wool of the mutton breeds, in common parlance, to come in washed at a duty of twelve cents per pound, Mr. Lawrence anticipates that now they will, in many cases, come in washed so clean that they will not shrink in scouring, sixteen per cent, and that one pound will give as much clean wool as two pounds of the average American unwashed merino, to the prejudice of the latter. There is no reason to anticipate this more than heretofore. Very little wool of this class is now imported, and what is, comes from Great Britain and Canada. Most of the wools that are associated with the mutton breeds of sheep, and those distinctively combing, are obtained from crossbreds, and go into class one wools as having an infusion of the merino blood. We think that there is no occasion to expect trouble from this source.

The "skirting" clause comes in for severe criticism on the part of Mr. Lawrence. This has been, and is, a sore spot with some wool growers, but justice to the manufacturer would never submit to the demands of Mr. Lawrence and his associates, for an additional duty on such wool, to the extent, at any rate, of four cents per pound, extra. Mr. Lawrence reasons that the skirting of Australian wool and its consequent lighter shrinkage, will make the nominal protection of eleven cents per pound on the domestic article practically only four cents. We do not understand how he figures this out, although he refers to evidence showing this to be the case, in some of his previously public statements.

In order that our readers may have a conception of the value of Australian wools that are skirted, we will submit the following facts, from authentic sources: The difference in price between skirted and unskirted wool in Australian markets, averages about four cents per pound. Seldom less than 20 per cent. of the wool is removed from the fleece and thrown aside as skirts. These skirts are made up of what is known as pieces and locks, the former commanding about two-thirds the price of the body wool, and the latter, one-half. In order to meet the demands of the American buyer, oftentimes the process of skirting is carried to what may be termed an excess, the American buyer being especially particular in his selections and demanding wools of light shrinkage. In such cases, the skirting is often carried to the extent of 40 to 46 per cent. of the weight of the fleece. In order that the average value of the fleece may be seen, we give the following figures for fleeces that are skirted, taking 21 cents, for the body, as the standard.

60% body @ 21 = 12.60
30% pieces @ 14 = 4.20
10% locks @ 10½ = 1.05 = 17.85 cts.
Average 1 lb. @ 17.85 cts

51% body @ 21 = 11.34
23% pieces @ 14 = 3.22
33% locks @ 10½ = 2.42 = 16.98 cts.
Average 1 lb. @ 16.98 cts.

80% body @ 18 = 14.40
20% skirts @ 12 = 2.40 = 16.80 cts.
Average 1 lb. @ 16.8 cts.

The value of the body wool is enhanced or decreased according to the amount of skirts taken from it. The prices given are actual.

COTTON MANUFACTURING IN RUSSIA.

We give in this issue an exceedingly interesting article on the "Progress of Cotton Manufacturing in Russia," by V. P. Polevoy, being a report of this

paper read before the recent meeting in Philadelphia of the N. E. Cotton Manufacturers' Association. The subject of cotton manufacturing in Russia has excited much interest of late, because of its rapid advances. If no better evidence of this can be had, it may be observed in the increased exportation of textile machinery from English workshops to that country, as noted in the statistics that have frequently appeared in these columns.

Edward Atkinson has just returned from an extended trip abroad, visiting Russia, and studying the characteristic features of its industries. His reported impression concerning the industrial qualifications of the Russians, is that there exists in them an immense amount of subdued energy, eagerness for information, and a desire for advancement. Mr. Atkinson seems particularly impressed with the rapid extension of cotton manufactures in that country, largely through the investment of English capital. We commend Mr. Polevoy's article to the attention of our readers.

A GREAT MANUFACTURING STREAM.

The annual reports of T. Jefferson Coolidge, treasurer of the Amoskeag Manufacturing Company, Manchester, N. H., always contain something of public interest. In his recent report, he refers to that of last year, in which he pointed out the damaging effect that was being felt by mill owners on the Merrimac River, due to the inconstancy of the flow of the stream, caused by the cutting down of the woods at the source of the different affluents of the river. He calls upon those interested, to appeal for proper legislative enactments, by which the destruction of the forests shall be prevented. This calls attention to the Merrimac River, itself, which, in many respects, is the most noted water power stream in the world, in the simple fact that more of its power is utilized than any other river with an equal extent of drainage area. It is a well known fact that the drainage basin of this river has been largely deprived of its forest growths, with the result of diminishing the flow of the water and the constancy of its supply. Fortunately, however, the river is greatly favored with natural reservoirs, there being over one hundred square miles of such reservoirs under control. The storage capacity of Lake Winnipiseogee and other lakes cover an area of 103 square miles.

It was not a great many years ago when the Southern part of the Merrimac basin was covered with forests, which would give from ten to twenty cords of wood per acre, while now, not more than five to ten cords can be obtained. The water power at Lawrence has the advantage of a drainage area of 4,600 square miles. The power utilized from the Merrimac River at Manchester, Lowell, and Lawrence, amounts in the aggregate, to about 35,000 horse power, pretty equally divided. The total utilized net or effective horse power of the river is estimated at about 90,000.

We do not think that there is any question of the favorable influence that is exerted by forests upon the flow and utility of streams for power purposes. They are generally regarded as having material influence upon the rainfall and temperature. Regarded as masses, trees are beneficial for mill purposes. They shade the ground and prevent sun and wind evaporation of rain or snow, while the leaves and mould act as a sponge in holding water, and regulate the delivery, if not the supply, of water. The chief value of any water power is its constancy, or freedom from frequent and violent freshets, such as referred to in Mr. Coolidge's report, and which was experienced by Manchester last July, when the water rose to eight feet above the Amoskeag dam, the highest freshet, with three exceptions, ever known at that place. Fortunately, no serious damage occurred, due to recent improvements in surrounding structures.

THE CYLINDRICAL COTTON BALE.

It will be seen elsewhere in this issue, that some of our Southern ex-

changes are arousing a feeling of opposition against the American Cotton Company, because of its seeming tendency towards monopolizing the handling and disposition of the cotton crop of the South. The company is looked upon as a monopoly, or trust, antagonistic to the interests of the cotton planter, as well as to those of the merchant. We can readily see that the tendency of the methods pursued by this company militate against the continuation of those now in vogue, affecting compress companies, factors, and brokers. At the present time the company is not a monopoly, but what will become of it, with the immense amount of capital that is reported to be behind it, there is no telling. It cannot become a trust, at any rate, and the only thing that it can do is to monopolize the business methods of disposing of the cotton crop.

So far as the spinners are concerned, they are not interested at all in the modus operandi of the company, so long as they receive their cotton in a better condition than they have heretofore, with an assurance from a responsible source that what they receive is like the samples representing their purchases. In order to accomplish even the good purposes of the cotton company, a large amount of capital must be available, and when this is the case, a monopoly may and naturally does follow. The way that business is conducted to-day, enterprises must be developed and maintained, with a large amount of capital behind them. To show the tendency of concentration and combinations, we have only to refer to the statistics relating to manufacturing establishments, as given in the last five censuses, as herewith tabulated. It will be seen that the average product of each manufacturing establishment was, in 1890, $28,000, against $8,300, in 1850. and that the capital of each manufacturing establishment was $19,000, in 1890, against $4,300, in 1850.

	1850	1860	1870	1880	1890
Average product of each manufacturing establishment	$8,280	$13,420	$13,420	$21,100	$28,107
Average capital of each manufacturing establishment	4,330	7,190	6,720	10,960	19,020
Average number of employees in each manufacturing establishment	7.7	9.3	8.1	10.6	13.8

TEXTILE SCHOOL AT PATERSON.

We have received a communication from the secretary of the Board of Trade, Paterson, N. J., in reference to the efforts being made in that city for the establishment of a textile school, with special reference to the industries of that section. The school is known as the School of Art and Industry, and its scope is to educate the young men of Paterson and vicinity in the difficult business of silk manufacturing. The course of studies is to be from the throwing operation to the finished article. Instruction in design will be for the present confined more to free-hand drawing and the processes of arranging the warp in the loom, to be taught as the first step leading to the art of designing. The school is to be supported by private subscription and State funds, there being a law of the State providing $5.000 for such a school, provided a like amount is secured by private subscriptions. Of course, a school of this kind is the out-growth and due to the importance of the silk industry about Paterson, which has grown from a town of 30,000 inhabitants, a few years ago, to one of 115,000 inhabitants, with a rapid increase of manufactures. The increase of inhabitants has not however kept pace, and the consequence has been that a number of the larger silk concerns have found it necessary to build annexes, so to speak, in other towns, as in Pennsylvania, where some of the coarse work is done, and where unemployed labor is obtained. In order to improve a

faulty state of affairs, a number of public-spirited men of Paterson concluded that the best way to make the city continue as the great silk center of the country, was to give the young men of the vicinity a technical knowledge of the business, not only for the purpose of improving themselves in their present field of labor, but to fit them to occupy the places of the skilful foreign workmen, whom it has become necessary to engage to take charge of the more important and intricate branches of the business. This school of art and industry was started on a small scale a year ago. The purpose now is to enlarge its scope of usefulness. The prospects for the school are extremely promising. It has already been started, giving three nights' work to instruction in designing and one night for free-hand drawing. A complete silk plant will soon be placed at the command of the instructors.

WATER POWERS OF GEORGIA.

We have been favored, through the courtesy of State Geologist, W. S. Yeates, with advance sheets of a report of the water powers of Georgia, compiled from notes of surveys, etc., conducted under the direction of the State, with other data derived from other sources. We have been conversant of the progress of this report for the last four years, and have had in our possession, for the last year, or more, an official map showing the location of the water powers of the State. We have been greatly interested in the unused water powers of the Piedmont district of the South Atlantic States, believing that in them is to be found the elements of much future prosperity affecting the manufacturing industries of that section. A large amount of official material bearing upon the water powers of North Carolina has been gathered, and is in the course of preparation for publication.

A map showing the location of the water powers of Georgia can be seen at our office at any time. A review of the report clearly shows that there is a large number of available water powers in the State, the greater portion of which are still unutilized. In fact, very few of the large water powers of the State are utilized. By bringing the statistical data given in this report, together, we find that there is at least 150,000 h. p. net, of water running to waste, which can be wholly, or very largely, put to profitable use, either by the establishment of factories near the powers themselves, or transmitting the efficacy of the latter any required distance by means of electricity. There is a large amount of unutilized power on the Chattahoochee River, near Atlanta, and especially between West Point and Columbus. Between these latter points there is a series of shoals, capable of furnishing 80,000 h. p., net, not yet used. Many of the available water powers are from eight to fifteen miles from the railroad, or any established station; still, we notice that there are also available water powers running to waste within three to five miles of the railroad. As we have stated, we believe that a large part of the future prosperity of the South in the line of manufacturing, depends upon the proper development of the water powers, not only of Georgia, but of all those belonging to the streams originating in the Blue Ridge of hills and mountains, and that their utilization will be found to be an economical undertaking, when compared with a steam plant, except in such locations where fuel can be obtained at a remarkably low cost.

The water powers of Georgia are confined to what is termed the Crystalline Belt of the State, which is in that part of the State north of a line joining Augusta, Macon and Columbus, and east of a line cutting off a small portion of the northwestern part of the State. Within this belt the water streams are made up largely of a series of shoals. There are four very important items to be taken into account in determining the value of any water power: (a) The quantity of water flowing in the stream at all seasons of the year; (b) the available fall; (c) its location; (d) the cost of development. The last three can be easily

ascertained by a competent engineer, within a short time, but the first requires a considerable length of time, as a series of gaugings, extending over, at least, twelve consecutive months must be undertaken. The State of Georgia has accomplished a valuable piece of work in the publication of this report.

LIMBLESS COTTON PLANT.

We make room in this issue for a letter from the director of the Government Experiment Station in Georgia, reciting his opinion and experience with the so-called "Jackson's Limbless Cotton," about which there has been so much published. Mr. Redding's opinion is not at all flattering to the staple itself, nor to the one whose name is attached to it. The seeds of this cotton, it is asserted, were brought to this country from Central Africa, in 1895, and attracted public attention under its present name, in 1896. It is claimed for it that it belongs to a new genus, and that the production of the plant is from four to six bales of lint per acre, on ordinary upland. We have, in these columns somewhat doubted the claims that have been made for this cotton, and that many of the statements concerning it were nothing more than species of exaggeration, however honestly they may have been believed in by those making them. We have no faith in its being a new genus. Whether it is a new variety is something that we cannot determine, as we have not yet received specimens of the plant, as have been promised us. We have entertained the impression, from the descriptions that have come to us of the plant, that it was nothing more than the Bamia variety. In this, however, Mr. Redding does not agree with us, and asserts pretty positively that it is nothing more nor less than a variety known as "Welborne's Pet," which was grown at the government experimental station in Georgia, in 1890 and 1892, and experimented upon at that time, though the variety had been before the planters of the South for five years previous, as the result of experiments made by Jefferson Welborne, Kerrs, Arkansas. Mr. Redding informs us that the seeds of this limbless cotton have been experimented with by him, with results far from those claimed for it. The results of his experiments show a production per acre of this season's growth, of less than 1300 pounds of seed cotton, being scarcely above the average, under skillful cultivation.

NEGRO OPERATIVES.

The labor problem, in which the negro is an important factor, is moving with great rapidity in the manufacturing districts of the South. The employment of this class of laborers was little thought of a few years ago, and its present status was scarcely anticipated as likely to occur for at least another generation to come. Notwithstanding the fact that there are many white people in the South that stand in need of remunerative employment, due largely to their own inclination to idleness, there seems to be a scarcity, in some sections, of mill operatives. Why this should exist, is a query with a great many, and apparently it will result in increased wages to the white operatives, so as to induce more of them to work, or the employment of the negro class at the same, or lower, wages, without any well defined consideration as to their fitness in the way of natural aptitude.

The only way out of this peculiar condition of affairs, as it looks to us now, is to make the wages of the white operatives a sufficient inducement for them to enter mill service. There is no doubt that so far as natural capacity and ability are concerned, the white operative is greatly to be preferred. It will take at least another generation, under careful tutelage, mainly through the influence of educational institutions and moral encouragement from the whites, to raise the negro class to a position with qualifications for good mechanics and skillful operatives.

The recent attempts in Charleston, S. C., to operate a cotton mill by negroes, has called wide spread atten-

tion to that city, and to the experiment that is being tried there. This, however, is not a new idea, belonging to that locality, for efforts in this direction are being made in North Carolina, and accounts have been widely published of a like attempt in the establishment of a 10,000-spindle cotton mill in Columbia, S. C., in which none but negroes are to be employed, except whites in the capacity of instructors or foremen.

New England Cotton Manufacturers' Association.

The Autumnal Meeting at Philadelphia. Philadelphia Hospitality. Everybody Happy. Valuable Papers Read and Discussed.

The autumnal, or semi-annual meeting of the N. E. Cotton Manufacturers' Association was held in Philadelphia, Oct. 27 and 28. The attendance was unusually large, nearly one-half of the members being present, many of them being accompanied by their wives and daughters. Of late years, these autumnal meetings have partaken largely of social features, which have made them unusually attractive, and removed much of the monotony and dryness attending the formal business of the association. This meeting was held in Philadelphia at the invitation of a number of the prominent citizens of that city, the members becoming essentially their guests. The headquarters of the association were at Hotel Walton, one of the finest hostelries in the United States. Many of the members, with their wives, arrived Tuesday evening and were royally received at the Walton by the entertainment committee, of which M. A. Furbush was chairman. The enjoyment of the occasion throughout was largely due to the forethought and affabilty of Mr. Furbush. This informal reception afforded opportunities for the renewal of old acquaintances and the making of new ones, and relieved the convention of much of its formality.

The first session of the convention was held Wednesday at 9 o'clock, in the auditorium of the Philadelphia Textile School, on Broad Street, which was elaborately decorated with cotton plants and open cotton bolls, making a very happy effect of green and white. The cotton was obtained from Mecklenburg County, N. C., where the Declaration of Independence was first inspired, and seemed to be particularly appropriate in this city, which is the home of the historical Liberty Bell, which was represented on the Association pin for this occasion, as illustrated at the beginning of this article.

The meeting was called to order by President Russell W. Eaton, who, after a few opening remarks, introduced Hon. Chas. F. Warwick, mayor of Philadelphia, who welcomed the members of the association in a very happy and facetious way, and at times holding his hearers spell-bound with his eloquence. At the conclusion of the mayor's remarks, Theodore C. Search, president of the National Association of Manufacturers, was introduced, who spoke upon the great importance of the development of an export trade in the products of our cotton manufactures. He showed that the cotton goods trade of the world is practically in the hands of four countries, whose aggregate exports amount to $430,000,000, more than three-fourths of which is in the hands of Great Britain, which spins and weaves cotton fabrics without raising a pound of the raw material within its borders, while the United States produces more than one-half of the cotton grown in the world, but supplies less than five per cent. of its manufactures of cotton to other countries. Over 95 per cent. of the world's trade in cotton goods is in the hands of Great Britain, Germany and France, neither of which raises a pound of cotton at home, and all of which are dependent on the United States for their raw

fiber. This position of the United States in its relation to a foreign trade is due very largely, in Mr. Search's opinion, to our too dictatorial ways in business methods in dealing with foreign buyers, overlooking the fact that German and English merchants are eager to do business upon terms which make us hesitate. We are not always willing to be as liberal in prices, terms, packing, etc, as our customers would wish, and herein is the cause of much of our retarded development in some lines of foreign trade. We view with distrust foreign merchants who wish to buy our goods, while we take greater risks at home with little hesitation. We make much ado about the long credits which foreign merchants are supposed to ask, while in some lines even longer time is given to buyers in this country as a matter of course.

Following Mr. Search's remarks, came the discussion of subjects relating more directly to the practice and wants of the factory, beginning with a most excellent paper by Edward W. France, on "The Influence of the Artistic in Textile Designing," an abstract of which, with illustrations, is given at the end of this report. The next paper was on "Modifications in Mill Design Resulting from Changes in Motive Power," by Stephen Greene, of Boston. Owing to the importance of this paper we shall give its essential features in our next month's issue, which our space will not allow to be done at this time.

With this, the morning session was adjourned, and the members took carriages to the Delaware River for an excursion to Cramp's ship yard, where ample opportunity was afforded for the examination of the works, the vessels and their construction. This trip consumed the greater part of the afternoon, and was full of interest. The Baldwin Locomotive Works were also visited at the same time. Many of the members, however, mostly the ladies of the party, took a drive through Fairmount Park, in tally-ho coaches and carriages. The scenic beauty of Philadelphia's famous park, with a brilliant autumnal foliage, was particularly attractive and fascinating. In the evening, a somewhat informal session was held in the assembly room of the Manufacturers' Club. Discussion was had upon several papers that were read at the spring meeting, but which were not debated at that time.

The Thursday-morning session was held at the Philadelphia Textile School, the first paper presented being one on "Power Testing on Frame Spindles," by George Otis Draper, Hopedale, Mass. Mr. Draper brought out, among others, the following points:

"The principal element of power consumption in a spindle is usually the amount of lateral friction due to the tension of the band. In present practice, this force pressing the spindle against its bearing, is equal to a direct pull, varying from a quarter of a pound to, perhaps, eight pounds. The average band pull on a frame in the usual mill is probably between two and four pounds, although one pound would be ample for ordinary conditions if constantly maintained. As bands are greatly affected by difference in temperature and moisture, the usual tension has to be high enough to allow variation. The other important factor of power in the naked spindle is the bearing friction due to the lateral pressure from the centrifugal force developed by the uneven mass of the revolving structure. The air resistance of the smooth metal parts must be trifling. The factor next in importance is usually the drag effect of the traveler pull, especially when spinning coarse yarns. This consumes a large amount of power, and varies with the size of the yarn being spun, the amount of twist, and the speed of the spindle. The amount of drag is adjusted by the weight of the traveler, and is therefore independent of any modification in the spindle itself. Another element is the weight or load carried by the spindle. This varies the vertical friction on the vertical support, which, however, is not important. The increase of power noted as weight is added is mainly due to the centrifugal force developed by the increasing unevenness of the load which multiplies the lateral bear-

ing friction. The air resistance is also an important factor, as the yarn surface is rough and unevenly distributed. Very few mills pay sufficient attention to their bands. Very few use a proper oil. Many never take advantage of the adjusting fit which may be present in their spindles, thereby allowing them to correct bad running and loosen tight bearings. Hardly any mill pays any attention to the removal of dirt from the spindle bearings. Then there are the evils of too heavy roll weighting, frames out of level, rings out of center, accumulation of dirt, etc. An important factor in band power is the size of the band. A large band produces more air resistance, and consumes more power at the same tension: large bands have little excuse for use on the usual spindle. The use of large rings and long traverse must affect the question of power, although there is usually more than enough economy in other directions to balance the extra power required. By using a little care the regular small spindle can be used for quite heavy work with a great saving in power especially as the heavier type naturally requires a higher band tension also."

After a limited discussion of a few topical questions, James A. Walsh, Lewiston, Me., read a paper on "Improved Methods of Drying Goods." Mr. Walsh said in part:

"Our method for accomplishing the best result has been to remove all fans from the walls of the rooms, and after sheathing the set of drying cylinders and carrying a pitched roof or hood to the ceiling, we have placed over the middle of the set two exhaust fans discharging directly into a flue on the lower room, and in the upper rooms into a revolving ventilator, which always carries the steam and vapors away with the wind, and prevents any down drafts. When a discharge is made into a flue on the lower rooms there is also attached at the top of the flue a revolving ventilator so that the outlets are all practically alike in discharging with the wind. In constructing the hood or roof the edge has been carried out about four inches beyond the upright sheathing on both sides and ends, and brought down an overhang about six or eight inches below the top of the sheathing and parallel to it. On the inside there is a diaphragm constructed of a light frame work covered with cloth, and which covers the space over the cylinders excepting about four inches on sides and ends, and as the steam and vapors arise from the goods when drying, they are carried along the smooth surface of the diaphragm to the outer edge, where they meet the current of air passing up through the opening between the upright sheathing and the hood, and are carried upward to the exhaust fans and discharged at once into the flue or ventilator, and this occurs so rapidly that no condensation ever forms, even on the inside, as the surfaces are all moderately warm if the temperature of the room is maintained at about 65 degrees before work commences. On bleached shirtings we dry readily about 65 to 70 yards per minute. On bleached sheetings we will average about 40 to 45 yards per minute on 8-4 to 10-4 goods. On ordinary cambrics our usual average is about 35 yards per minute for colored work when we are drying four strings at a time, and on the goods that are starched for heavier finish we maintain the same speed by drying only three strings at a time. On silesias we show an average of about 40 yards per minute with three strings drying at same time. The temperature of our goods after being dried will, of course, vary with the different colors on dyed work, as blacks and dark browns will retain the heat longer than the lighter shades. We find our dark shades show about 98 to 100 degrees in the bunches immediately after coming from the cylinders. Our bleached wide sheetings will show about 95 degrees and bleached shirting about 90 degrees. But at these temperatures the conditions are favorable for the goods to cool readily before being sprinkled, and they will absorb the water moderately enough to properly prepare them for the calenders."

This paper was followed by one that was prepared by John R. Mason, Fall

River, Mass., on "Old Style Carding vs. New Style Carding." Mr. Mason said, in part:—

Under the old system the laps of the finisher picker were weighed two or three times a day: that is, we unrolled a lap and measured off one square yard of it and weighed it, and that was considered the weight of the lap. There was nothing very particular about it, as the doublings of the railway head and the evener of the head were supposed to even up whatever variation there might be. But under the new system one of the most particular places in the carding department is in the picker room, and the man in charge here must be trustworthy, for here, and only here can you do anything towards getting even work, for as the laps go from the picker room to the card, so the roving and yarn will be for there is nothing to even the work except what little the doublings may do. So if there is a great variation in the weight of the laps from the finisher picker, there will also be a great variation in the roving and yarn, and it will be found hard work to keep the numbers right.

Under the old system of the wooden top flat card, there was not the amount of carding surface that there is on the revolving flat card. The cylinder on the old style card tore the lap as it passed between the feed rolls, with an upward pull, which had a tendency to pull back or straighten the wire on the cylinder, making the cylinder do work that it was never intended to do, besides carrying all the leaf and dirt that may happen to be in the lap up by the tops, and what was not deposited on the doffer with the cotton was dropped between the cylinder and doffer: for if you look at the fly that is taken from under the old-style card, you will notice that all the dirt is from under the doffer, while on the revolving flat card the saw tooth licker-in strikes the cotton as it passes by the feed plate with a downward blow, knocking the leaf and dirt out of the cotton and depositing it on the floor under the licker-in and carrying the cotton to the cylinder, thus saving the cylinder the extra work of pulling the cotton to pieces and not pulling back the wire on the cylinder, as on the old style, and yet cleaning the cotton of leaf and dirt better than under the old style and doing it before the cylinder received it. Every overseer of a card room knows that under the old system, when the self-stripper on the card raised the top to strip it, a lot of fly would gather in the open space caused by the top being raised, which (when the top was again dropped into its place) was blown on to the cylinder, causing a thick streak across the sliver, besides letting dirt from the stripper get on to the cylinder. A great many overseers have tried to prevent this in one way and another. Someone suggested having a stripper made which would traverse very slowly from one top to another, but which would raise the top strip and lower it again with increased speed, so as not to have it raised from the cylinder long enough for much fly to gather in the open space. Now on the revolving flat card the flats are constantly moving forward, carrying whatever dirt may have collected in them to the comb, where they are stripped without a flat being raised from the cylinder, and consequently there are no streaks in the sliver and no dirt getting on to the cylinder on account of the flats being raised from the cylinder. Then as the settings on the old top cards were anywhere from 1-32 of an inch to 1-16 of an inch from the cylinder, it depended altogether on the condition that the clothing was in. If that was in good condition the settings were closer than they were if the clothing was a little soft; and again, as the cylinders were not perfectly true, the settings could not be close, while on the revolving flat cards the cylinders being very nearly true, we set a great deal closer than on the top cards, our settings being 5-1000 of an inch to 9-1000 of an inch, in consequence of which we get a great deal better quality of work from the new system than we ever did from the old system. The question has often been asked, why is it that some men who have been very successful running the

old style carding fail when they try the new style carding? I think from what I have observed that the reason is that they do not realize the difference between the two systems and therefore are unable to overcome the difficulties. There are at least three things that should be required of an overseer of the new style carding. First, he must understand the cards in his room. Second, he must know when certain things should be seen to, and third, he should know that those things are attended to at the time they ought to be. For the new style carding requires the constant attention of the overseer to the grinding, setting, stripping and cleaning of the cards. The overseer who gives these things his personal attention and has a regular system for his work, so that one thing follows another, and the grinder and strippers know just what to do at certain times in the day, and therefore has everything kept in order, will not be the overseer who will make a failure of the new system, but will be successful. Another thing we have on the new system that we did not have on the old, is the combination draft on the fine roving frames. By this draft we can change 1-10 of a tooth or 5-100 of an inch of draft and should therefore (with the attention given to weight of laps) be able to keep our numbers quite even. Another difference between the old and new style carding is the general appearance of the cloth. Under the new system the cloth, by reason of the better carding (caused by closer settings on the cards and more dirt being taken out of the cotton), presents a cleaner and smoother appearance than it did under the old style of carding.

The afternoon session was preceded by a visit to the Philadelphia Bourse, when a luncheon was served. The session was held at the Philadelphia Commercial Museums, at which the first and principal paper presented was on "The Movement and Statistics of Cotton Goods," by Dr. William P. Wilson, Director of the Museums. Dr. Wilson said in part:—

The main increase of exports for the United States has been in the trade with Asiatic countries and Australia. The increase for China during the last year was 60,000,000 yards; 73,000,000 yards having been taken in 1895-96 and 133,000,000 in 1896-97; in Asia and Oceanica outside of Australia, India and China, the increase for the same time was from 5,900,000 to 33,710,000 yards. It is said that the increased importation of American cotton goods into China arises from the fact that, being heavy goods, they are more especially taken by Manchuria and Northern China. China took 542,000,000 yards in 1896 from Great Britain, or about four times the amount taken from the United States. This gives some idea of how large the Chinese market for cotton goods now is. The question of widths and colors affects the sale of goods, and these are determined upon by the English and other European nations upon private information from agents and commercial missions.

Take the matter of color. The labels may be made so as to sell or prevent the sale of the goods. In the colors of labels it is well to avoid plain white, plain buff, and the combination of blue and white, these to a Chinaman being associated with death and consequently unlucky. The Chinese favorite colors are red and yellow, the former being associated in the minds of the natives with rejoicing, the latter with dignity. The undraped or partially draped human figures should be avoided. Indeed the use of the human figure at all in trade marks and labels for use in China is dangerous. Some detail quite harmless to us may have an ominous significance to the Chinese. A gentleman of experience corroborates these views as to native tastes and superstitions, by suggesting that there would be a demand for colored cloths if our manufacturers would study native tastes. He commends the following colors: (1) Light-blue or lilac ground, with flowers in black; (2) Crimson ground with flowers of five colors, these for children's clothing; (3) Light-blue ground with white flowers, for curtains and bed-coverlets.

It is also suggested that if American drills were tanned so as to bear the wet without rotting, such might be ul-

timately sold in the Empire in enormous quantities for use as sails.

England's largest market is India. England sent $82,600,000 of cotton goods to India in 1896. In this trade India is the largest customer of Great Britain, taking about 1-3 of all of England's enormous export. If Americans would look after this market, which seems to be too much neglected by them, they would surely secure a good share of this trade. The fact that it is an English dependency does not necessarily militate against us, for in many English colonies American goods in various lines are competing successfully with those of English and German merchants. We are far behind Great Britain in the near-by markets. In these countries, the United States is not even second, Germany leading her in some of them, and Italy and Belgium in others. For this, various reasons are given; lack of banking facilities, need of American local houses, need of American steamship lines: but probably the only one of the many reasons given, not equally true of countries in which we are successful, is the fact that here English is not the commercial language. English and German dealers are familiar with the language of the country where they engage in business; our own are not.

In a study of the different kinds of cotton goods exported, we find that Great Britain is losing ground in the lines of white goods, while she is gaining in printed and dyed goods. British manufacturers claim that, in this way, they more than make up for any loss in uncolored goods This changed relation of lines of goods, they claim to be due to the improvement of their technical schools, in their attempt to make them equal to those of Germany.

Other papers followed relating to the export and import of cotton goods, followed by a paper on the "Progress in Cotton Manufacturing in Russia," by Vladimir P. Polevoy, New York City, whose paper appears in this issue on page 48, illustrated. The evening session was held at the Philadelphia Textile School, where several papers were presented by title only. The time of this session was taken up listening to an address by Charles Heber Clark, Philadelphia, on "Philadelphia as a Textile Manufacturing Center." Mr. Clark represented Philadelphia as the leading city, in many respects, for manufactures in this country. It was not so much what Mr. Clark said, as the happy manner in which he expressed his views, that was particularly pleasing to his hearers. Some of his points were so happily expressed that he was given an encore, to which, however, he did not feel inclined to respond more than to bow his acknowledgements. The occasion ended with a social entertainment given to the ladies, at the Textile School.

The citizens of Philadelphia showed throughout a charming spirit of hospitality. The social entertainments were conceived and carried out in a most handsome manner, which is not expected to be equalled in its munificence at any other place where the association may hereafter have the pleasure of visiting for its autumnal meeting. There was a universal expression of gratification and delight in the way that everything was provided to make the social features of the occasion pass off to the pleasure and satisfaction of those present. There were many, very many, side attentions extended that space will not allow of enumeration. No less than sixteen resolutions were passed by the Association thanking the organizations and individuals whose efforts had contributed so much to the entertainment of its members. Especial thanks were extended to James Butterworth, chairman of the general committee; E. W. France, secretary of the executive committee; M. A. Furbush, chairman of the entertainment committee, and to Mrs. E. D. Gillespie, president of the associate committee of women.

The visiting members were invited to make free use of the carriages provided for sight seeing, etc. Arrangements were made, and the visiting members were cordially urged to accept first class tickets with reserved seats, of any of the leading theatres for matinee and evening performances, on any of the three days of

the convention. The Western Union Telegraph Co. and the Postal Telegraph Co. very cordially tendered the free use of their services during the convention, the officers of these companies accepting free all personal or social messages presented by the members. The Bell Telephone Co., also kindly gave the free use of all their lines to members of the association, and the American Telegraph and Telephone Co. allowed the free use of their long-distance service at specified hours of the day.

The following were elected to membership in the association.

For honorary membership: Jones S. Davis, Holyoke, Mass.

For active membership: Thomas Armstrong, superintendent North Pownal Manufacturing Company, North Pownal, Vermont; Robert Beatty, Robert Beatty & Co., Philadelphia, Pa.; A. C. Bent, agent Safety Seamless Pocket Company, Taunton, Mass.; Thomas J. Brown, George Brown Sons, Mount Joy, Pa.; John P. Bodge, treasurer Arkwright Mills, Fall River, Mass.; T. Ashby Blythe, proprietor Ashby Cotton Company, Philadelphia, Pa.; George De Forest, treasurer Mohawk Valley Mills and Utica Steam Cotton Mills, Utica, N. Y.; Joshua Garsed, Garsed & Co., Frankford, Philadelphia, Pa.; Thomas Horsfield, superintendent Hargrave's Mill, Fall River, Mass.; D. Edwin Irving, treasurer The Irving & Leiper Manufacturing Company, Chester, Pa.; John Leiper, superintendent Fitchburg Manufacturing Company, West Fitchburg, Mass.; A. P. Malcolmson, superintendent Jewett City Mills, Jewett City, Conn.; W. H. Richmond, superintendent Bibb Mill, Macon, Ga.; F. C. Sayles, president Ponemah Mills, Pawtucket, R. I.; Henry B. Sawyer, assistant treasurer Newmarket Manufacturing Company, Boston, Mass.; John Smith, superintendent Chace Mills, Fall River, Mass.

For associate membership: French Campbell, Commission Merchant, Manchester, N. H.; Frederick A. Downes, secretary of Factory Mutual Fire Insurance Company, Philadelphia, Pa.; L. C. Farnsworth, Farnworth Card Clothing Company, Pittsfield, Mass.; Merrill A. Furbush, M. A. Furbush & Son Machine Company, Philadelphia, Pa.; Henry T. Grant, Jr., president Mercantile M. F. Insurance Company, Providence R. I.; Alfred H. Hartley, dealer in Oils and Mill Supplies, Fall River, Mass.; Alfred A. Hunting, Mechanical Engineer, Boston, Mass.; John H. Lorimer, Scouring, Dyeing and Drying Machinery, Philadelphia, Pa.; William R. Noone, Manufacturer of Roller and Slasher Cloth, Boston, Mass.; James Strang, the Metallic Drawing Roll Company, Indian Orchard, Mass.

—The belting, shafting, gearing and drums of all factories, when so placed as to be dangerous to persons employed therein while engaged in their ordinary duties, shall be as far as practicable securely guarded. All factories shall be well ventilated and kept clean.—[Mass. Law.

Cotton Machinery Works Consolidation.

A special meeting of the stockholders of the Saco Water Power Machine Shop was held in Biddeford, October 28th. for the purpose of acting on the proposition for a consolidation with the Pettee Machine Works of Newton Upper Falls, Mass. The plan of consolidation, as outlined by the directors, was unanimously voted to be adopted. It is understood that both present plants will be operated, each building the machinery for which it is best adapted. The consolidated works will be in a position to furnish, practically, a complete outfit for a cotton mill. Some of the minor details of the consolidation are still left open for final arrangement, and the meeting adjourned for one week. Mr. James H. McMullan will be president of the new company, and the management will be in charge of the present managers of the Pettee Machine Works, Mr. R. P. Snelling, treasurer, and Mr. F. J. Hale, agent.

—No person or corporation, or agent or officer on behalf of any person or corporation, shall coerce or compel any person or persons into an agreement, either written or verbal, not to join or become a member of any labor organization, as a condition of such person or persons securing employment or continuing in the employment of any such person or corporation.—[Mass. Law.

—Perfect laps will not produce perfect carding, unless the cards are in condition to do what is desired of them.

—There are many honest differences of opinion as to the best method of carding cotton.

The White-Sullivan Combined Quarter Saver and Stop Motion for Knitting Machines.

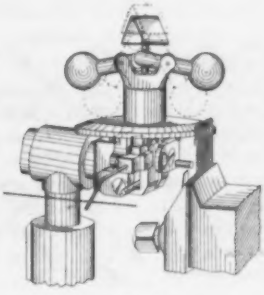
This important attachment for circular spring needle knitting machines deserves the careful consideration of manufacturers, for it combines a highly ingenious inventive idea with

careful and intelligent mechanical execution. The fixture in its present form is the result of several years' careful experiment and trial, and although the device, which is now ready to put upon the market, has been little exploited, it has received, none the less, careful test in practical mill operation.

The important points in connection with this quarter saver and stop motion are clearly outlined as follows:—

The thread wire rests only on the yarn when the machine is running.

The thread wire is automatically supported by the stopping of the machine.



No. 1.

The thread wire is automatically released and allowed to rest on the yarn by the starting of the machine.

The presser is automatically released from the needles by the breaking or running out of the yarn before any defect can possibly be made in the goods, even on the most rapid machines.

The machine is stopped automatically by the breaking or running out of the yarn.

It is claimed to prevent any defects in the goods, even when the yarn is cut by the loop wheel on a pull up, and positively asserted that no extra tension is added to the yarn; that it reduces running expense about one-third, adds greatly to the production, prevents making waste, and is not in the way when cleaning up.

The builder guarantees that it will save its cost the first year in use, and the fixture will wear as long as any working part of the machine.

The Glenark Knitting Co., of Woonsocket, R. I., have four hundred of these fixtures, some of which are on 48 gauge. Mr. White has received the following endorsement from that company:—

GLENARK KNITTING CO.,

Mr. A. White, 9 Western Ave., Lowell, Mass.

Dear Sir: The White-Sullivan Stop Motions which you have recently put onto the machinery of the Glenark Knitting Co., are pronounced by the superintendent as a perfect success, and are doing their work very satisfactorily.

Yours truly,

C. B. Fillebrown, Pres.

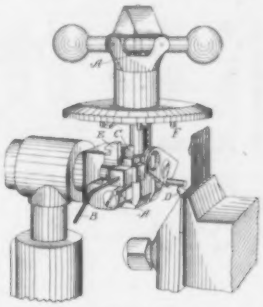
Boston, Jan. 9, 1897.

The accompanying illustrations show its operation very plainly.

Fig. 1 shows the position when the machine is running. Dotted lines show position when the machine is stopped by hand.

Fig. 2 shows the position when the machine is stopped by the breaking or running out of the yarn.

A. A wire passing through the stud and operated by the governor to support the thread wire at all times when the machine is not running. B. Thread wire. C. Dog that comes in contact with pins F in bottom of presser when thread wire drops. D.



No. 1.

Trip on cylinder that stops the machine. E. Dog that holds the plate down that the presser runs on.

The device was patented May 5, '96, Feb. 9, '97, Aug. 3, '97, Aug. 24, '97, three patents, and other patents are pending in this and foreign countries.

Practical men will appreciate the advantage and economy of a device which really accomplishes the points claimed for this fixture, and the builder, Mr. A. White, 8 Western Ave., Lowell, Mass., earnestly invites interested parties to make the most thorough investigation, and solicits correspondence.

The Importance of the Artistic Element in Textile Education.

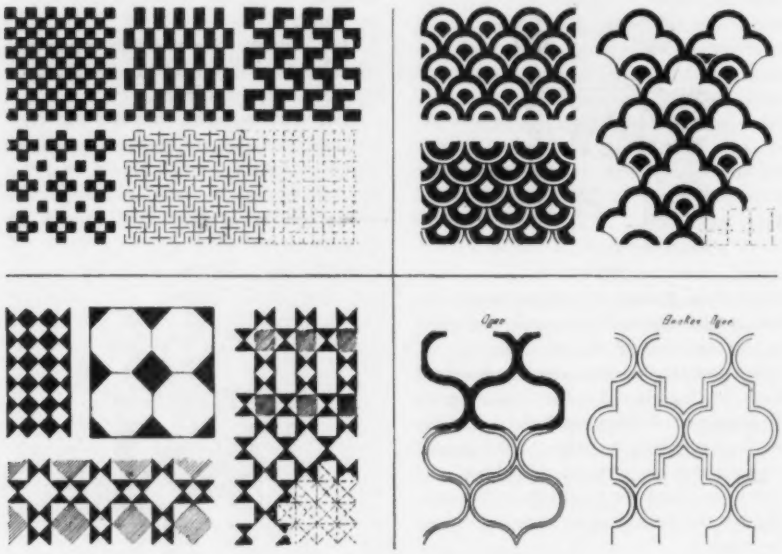
Abstract of a paper read by Edward W. France, Director of the Philadelphia Textile School, before the New England Cotton Manufacturers' Association, at Philadelphia, Oct. 27, 1897.

The importance of a careful training in the technical processes of the textile industry is beginning to be realized in this country, although the extent to which this is true is by no means commensurate with the immense interests at stake.

Europe recognized long ago the supreme importance of educating its people in the technical details of their vocations, and this has especially been true of textiles. Many schools have been established by the different governments for the diffusion of knowledge in relation to this important branch of manufacture, and the claim that Germany's supremacy in manufacturing is mainly due to her generous provision for systematic education of this kind, is heard on every hand, and is generally accepted as perfectly established. The lesson for American manufacturers is, therefore, very plain. If we expect to win our way to the highest kind of success in textile production, we must build better in the years to come than we have built in the past.

The truth that needs to be brought home to those who are looking to technical education for the solution of the industrial problems which press the hardest upon us, is the fact that culture, and that of the most thorough kind, is not to be dispensed with.

The industries of the world are rapidly being transformed by the revolutions wrought by science and the development of scientific processes. The old methods of doing things are rapidly giving place to new ones, which the laboratory of the chemist and of the mechanician have developed, and the road to success in any branch of economic production lies through the portal to which science holds the key.



GEOMETRICAL DESIGNS

It is not, after all, altogether on the side of science that our industrial needs are most apparent to-day; rather it is on the side of art. It is in matters of taste that we need training the most; it is the artistic element that constitutes the charm of textile productions and enables the good goods to hold the market. No amount of cheapening of processes can compen-

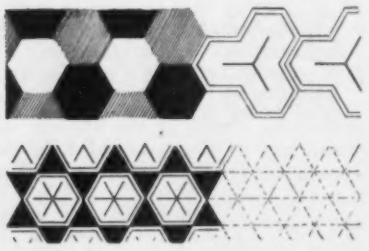
sate for the absence of this quality, and no amount of merely technical education or mechanical skill can supply this want. It is time for the truth to be spoken on this head; we have been strangely backward in learning this lesson. Manufacturers and those who direct the affairs of great establishments often excuse their own shortcomings in this regard by saying the matters of taste are no concern of theirs; that they try to understand the demands of the market and are willing and even eager to produce the ugly things, as well as the beautiful, if the public seemed to want them. This familiar form of argument is at once a fallacy and a confession. On the one hand, the man who uses it really does not, as a rule, know what is good and what is bad himself, and is more or less conscious of his own deficiency in matters of this kind; and on the other hand (and this is really a much more serious matter), the public is certainly ahead of the manufacturer in matters of taste. The product of foreign looms has found, and is finding, a market in our midst, not because it is cheaper, but because it is more beautiful; and it is more beautiful, not because of the employment of better machinery or more economical methods of production, but because its character is determined by a finer taste. This is the real secret of the whole business. We shall fail to command in the future (as we failed to command in the past) the market for the higher class of goods, until our workmen and designers are as tasteful as those on the other side. The infusion of this element of beauty into our products in the future means training in art for the men who are to do the work, and it cannot possibly mean anything else. It means that if his efforts are to achieve success, the student of the textile school must devote a great deal of his time to the pursuit of art; must be familiar with the principles, not only of chemistry and mechanics, but of form and color; that he must be familiar with, and appreciative of, the essentials of grace and beauty quite as much as he is with the nature of fabrics or the efficiency of machinery; for unless he can import into his work the element of charm which only the æsthetic sense can provide, the most important part of his work has been left undone.

The purely artistic effort and the actual processes of manufacture, have, for the most part, still to be made; the chasm which still yawns between art and industry has still to be bridged. The explanation of this is to be found quite as much in the standards which art education has set for itself, as in our shortcomings on the side of technical instruction. Much remains to be done on both sides, for if the technical schools have been too mechanical in their methods, the art schools have on their part been too much occupied with things whose connection with industry has been too remote to make their influences felt, —at least by the present generation of producers. Pupils of the average art school are mainly occupied with the drawing of plaster casts of the divinities and heroes of Greece and Rome, and to draw and paint from the living model has almost come to be regarded as more of an end in itself than as a means of profitable development of the student's power, to say nothing of the failure to turn this power to any account in original design. Unfortunately, too, the pupil who has wrestled long with the difficulties of drawing, which it is the business of academic training to overcome, is usually further off from accomplishing anything in original design or composition of any kind than when we began. It is a standing and well-deserved reproach of academic training in art that its recipients are in very great danger of losing all enthusiasm for original work of any kind, and even if this were less true of art work in general than is unfortunately the case, it would still be true that the student of academic art everywhere very soon passes the point where he is likely to be of any use as an industrial designer. To be of much use then, in shaping the minds of future designers in all such lines of work as the textile manufacturer is interested in, the course of most art schools must be profoundly modified in the following directions:

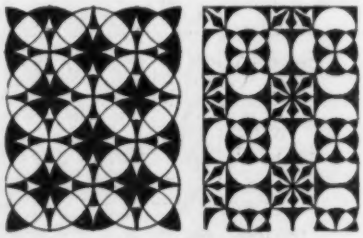
In the first place, a great deal more attention ought to be paid to the study of nature in its more decorative aspects—that is of flowers, fruits, birds and all such simple forms of natural things as those which the mind of man instinctively turns to in order to get his ideas of what is decorative and festal. The student must study nature early and assiduously in her decorative aspects, especially on the side of color, which, by the way, is persistently and consistently neglected in most schools of art till the last stages of the student's career, when, as I have tried to show, he has long passed the point where he is likely to be of any use as a designer. With this study of nature in her decorative aspect, must be associated that conscious and deliberate adaptation of her forms to the purposes of practical design which is a fundamental in all practical work, intelligent conventionalization being the corner stone of all good work in applied design. This, again, is one of the things which the ordinary art student learns to despise in just about the same degree as his powers as a technician become developed, and is therefore something which must not be left until his training is very far advanced, but must be taken hold of as one of the very fundamentals of his course.

Secondly: The practical design means an intelligent grasp of the limitations imposed by the processes of manufacture. Such character as industrial design ever assumes, that entitles it to respect and consideration as bearing the impress of that indefinable quality which we call "style," is due to the frank recognition of these limitations, and to that wise adaptation of means to ends which such recognition, skillfully adapting itself to meet the conditions thus imposed, implies. It is through such practice as this that the student is prepared to take up the study of historic styles of ornament, because only in this way does he learn to understand style itself.

The all important matter of color is systematically neglected in most schools at the only period of the pupil's development when it can be most profitably studied. Color furnishes the very first element of interest in textile decoration, and is the most elementary thing with which the decorator deals, so that its use should be one of the first things with which a textile designer becomes familiar.



GEOMETRICAL DESIGN.



DESIGN FROM FLORAL MOTIVE.

Its profitable employment for that matter may long precede any skill in drawing which is worth talking about.

A systematic study of color without waiting for it to come at the end of the course in drawing, is one of the very first things to be considered in the education of the textile designer. Our particular aim in the Philadelphia Textile School is to set the student to work with color, in such schemes as are represented by stripes and plaids, at the very outset of his career, and his mind is for some time occupied with the study of color problems as such. He is taught the fundamentals of color theory and the laws of harmony with reference to such elementary uses of color as these early forms of ornament represent, leaving all the more difficult work, which requires skill in drawing, to a later period.

With reference to the limitations imposed by materials and the processes of manufacture, the student of the textile school naturally approaches the subject of design from a somewhat different point of view from that which the art student occupies, and much less formal instruction on this point is necessary in his case. He learns to use his pattern as a woven pattern first, and the conventions which chiefly characterize the ornament come to him readily enough. That his experience furnishes the only true point of view from which to study the whole subject, is so obvious a truth that I shall not insist upon it here; I only regret that so much valuable time has been wasted by instructors who know so little about the real nature of these limitations, and therefore about the true character of all good textile decoration.

Wool Clip of 1897.

The National Association of Wool Manufacturers has sent out advance sheets of an article that is to appear in its December Bulletin, giving certain statistics as the result of their census of the wool clip of the United States for 1897. The peculiar and unprecedented situation of wool in this country led the Association to take more than its usual pains in the compilation of the annual estimate of the domestic clip. The figures of the Department of Agriculture, as to the number of sheep for this year, has been accepted as in years past. The Department's figures, however, differ materially in many instances from those of the State authorities, which are those of assessors, and it is found that almost without exception the latter report a less number of sheep than that given by the national department. The Association estimates the domestic clip for 1897 as follows:

Number of sheep	34,784,287.	
Average weight of fleece	6.30	lbs.
Wool washed and unwashed	219,153,251.	lbs.
Pulled wool	40,000,000.	lbs.
Percentage of shrinkage, fleece wool	60.10	
Scoured wool, fleece and pulled, estimated	111,365,987.	lbs.

This shows a decrease of over 13,000,000 pounds in the grease, or nearly 4,000,000 pounds clean as compared with the clip of 1896; or a decrease of nearly 90,000,000 pounds in the grease, or 40,000,000 pounds clean, as compared with the clip of 1893. The production of wool in the latter year was especially large. The Association makes the available supply of wool for 1897, 702,568,428 pounds. This estimate is made up as follows:

	Pounds.
Wool clip of 1897.....	259,153,251
Domestic wool on hand Jan. 1, 1897	123,588,080
Foreign wool on hand Jan. 1, 1897	26,844,000
Foreign wool imported Jan. 1 to July 1, 1897	292,983,097
Total	702,568,428

A similar statement last year showed the amount thus available, to have been 508,549,594 pounds, indicating an increase of 194,000,000 pounds—nearly all foreign growth. It is noted that notwithstanding the supply is in excess of that of last year, it is not at all out of keeping with the strong market conditions which prevail. The demand for wool has of late been strong, and is likely to continue so, due to the active state of manufacturing. Manufacturers have a comparatively clear field, as the increased demand for their products has come upon a mar-

ket not over-stocked with foreign goods.

The Association makes a note of the tendency of sheep breeders to change from merino to mutton breeds, which has been the course for a number of years past. "This," it says, "in connection with a favorable winter, has resulted, in the territorial sections, in a somewhat lighter fleece, shrinking from two to three per cent. less than last year. It is, however, evident that, in the opinion of many, the movement towards mutton sheep has been carried to an excess, and that there will shortly be a reaction in favor of fine wool." These views have been entertained and expressed by us upon several occasions within the last two or three years; i. e., more attention is given to crossbred wools than to the pure merino, which, in time, will make the wool of the latter comparatively scarce, unless a change in breeding is brought about more in accordance with old lines.

The Association's figures present some interesting facts, relating to the percentage of foreign wools used in our domestic manufactures. In 1893, when the domestic production of wool was particularly high, there was only 12.4 per cent. of foreign wool imported, while in 1896, when the domestic production was low, the percentage of foreign importation was 56.5. This relative use of foreign wools will probably be exceeded this year.

The Proctor Improved Double Fancy Garnett Machine.

Under the direction of J. K. Proctor, who is the pioneer designer and builder of this class of machinery in the United States, having been engaged in it for the last twenty-six years, the Philadelphia Textile Machinery Company, Philadelphia, are building a line of Garnetts containing new and valuable improvements. The Proctor Improved Double Fancy Machine, cut of which is here shown, is claimed to be the most efficient machine yet produced for reducing to nearly its original fiber the finest double and twisted yarn waste, ring waste and pickered clippings. The stock is raised twice over each main cylinder after passing the workers, that is, four times in a two-cylinder machine and six times in a three-cylinder machine. This is one of the chief causes of the machine's remarkable efficiency in quantity and quality of work. Another feature is the retainer roll placed over the feed apron and in front of the feed rolls; this effectually prevents the stock from being violently drawn into the machine. The Garnetts are built in the usual widths,—40", 48" and 60", and with one, two or three main cylinders as required.

Machines of this type have recently been installed in the following mills: John H. Wallace and Brother, Philadelphia, Pa.; Thomas Mabbett, Providence, R. I.; C. B. Carroll, Manufacturing Co., Cohoes, N. Y., and Oneita Knitting Co., Utica, N. Y.

The "Limbless" Cotton Plant.

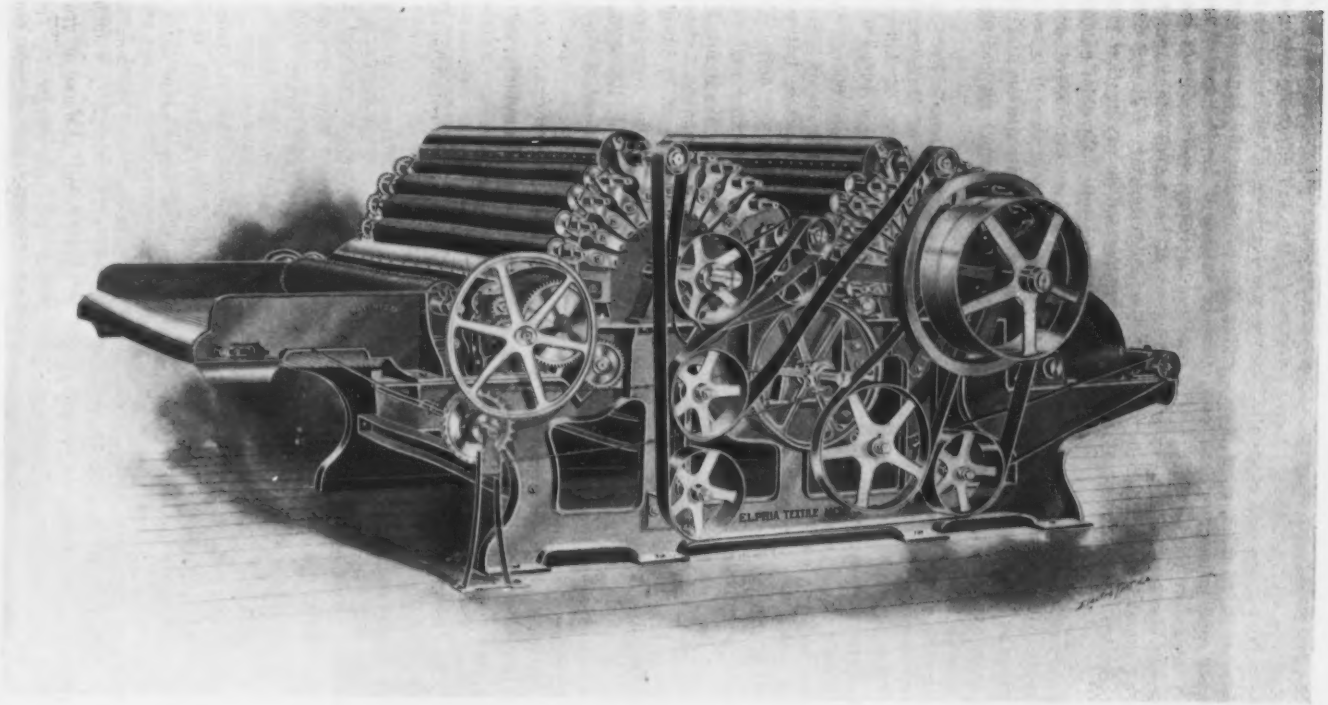
Editor Textile World:

I notice in some of your issues that you have more or less to say regarding a new variety of cotton, or so called, grown by T. A. Jackson, Atlanta, Ga. It is frequently spoken of in the press as a "limbless" plant, raised from seed obtained in Africa. I have experimented with the seed of this cotton, and desire to make the following observations:

(1) It is not absolutely a "limbless" cotton, but puts forth lateral branches more or less freely, from near the surface of the earth in which it grows. When the plants are rather closely crowded together in the rows, this disposition to branch is to a considerable extent restrained, as is true of other varieties, long known in the South, which have the same habit of development.

(2) The bolls (or fruit) are borne on short fruit spurs from 2 to 6 inches long, without terminal buds, or growing extremities, each containing from 2 to 6 rather under-medium sized bolls. In other words, it is distinctly a "cluster" variety.

(3) The long branches that proceed from near the base of the stalk have



TWO-CYLINDER PROCTOR IMPROVED DOUBLE-FANCY GARNETT MACHINE.

usually the same arrangement of short fruit spurs and bolls.

(4) The plants, owing to the arrangement of the fruit spurs, and especially when crowded in the rows, grow from 20 to 25 per cent. taller than most varieties of upland cotton.

(5) The lint is somewhat longer than the average upland short staple, but it is not remarkably long, nor fine, nor silky.

(6) On very rich soil it may be rather more productive than the average of select varieties of ordinary uplands, but not so on average and poor soils.

(7) It is not of a new genus, nor even a new species, as have been claimed; it is not even a new variety.

(8) I have no doubt it is identical with the variety known as "Welborn's Pet," introduced a dozen or more years ago, by Mr. Jeff Welborn, now of Kerrs, Ark., who has been, and is now, selling the seeds at not more than $2.00 per bushel. I grew the "Welborn's Pet" on this farm in 1890 and 1892, and am familiar with its character. I would unhesitatingly stake my reputation as an "expert" in varieties of cotton, on the correctness of the statement that the two cottons are identical.

(9) I have the so-called "Jackson" African Limbless growing in our variety test grounds on the farm, and at the close of the picking season will publish the yield per acre of each of the 21 varieties in the test. So far, the so-called "Limbless" stands No. 10, in product per acre to date, in the list of 21 varieties. Later pickings will not, probably, materially change its rank in the scale.

(10) I also have a few plants of the so-called "Jackson" Limbless Cotton growing in our cross-fertilizing grounds, where the plants, for convenience in manipulating, have an excess of distance. These plants all have more or less long limbs, each more or less developed, just as the main stem is. One plant has no less than eight of these lateral branches, or limbs.

(12) On the whole, I am satisfied that this variety falls short in every claim that has been made for it by its promotors, and I think it is doubtful if it can compete successfully with any one of several other long-cultivated varieties. Mr. Jeff Welborn has for some years (12 or more) been developing this cotton for the express purpose of suiting it for the use of the machine harvester, and has made several tests of its special adaptation to the machine harvester. I do not wish to be understood as saying that it is a worthless variety. My chief contention is that it is an established, comparatively old variety; that it is not a new genius, not a new species, and not remarkable in any other respect than above described.

You will find "Welborn's Pet" described on page 210 of Bulletin 33, from U. S. Department of Agriculture, entitled "The Cotton Plant."

I will add that I have visited Mr. Jackson's field of this cotton. It is a very fine field of cotton, but will barely make 1½ bales per acre. The soil is a highly cultivated and very highly manured spot. What I call a "dunghill" spot, and capable, I should judge, of producing 60 or 70 bushels of shelled corn per acre.

R. J. REDDING,
Director Experiment Station.
Experiment, Georgia.

Progress in Cotton Manufacturing in Russia.

Read before the New England Cotton Manufacturers' Association, at Philadelphia, by Vladimir P. Polevoy.

The Russian cotton manufacturing of the present time has reached the stage of development when, not satisfied with almost complete exclusion of foreign fabrics from the immense interior market, it increases each year the export of home fabrics to other countries. Like in any other branch of Russian industry, the progress was made by gigantic strides and not gradually. The man, who visited Russia ten years ago, will be unable to recognize the Russia of to-day. America is the only country in the world which could be compared with Russia in regard to rapid progress in the manufacture of textile goods. We manufacture print cloths which could vie with the finest French fabrics; our silk

stuffs are equal to those of Italy; our velvets are equal to the best products of Lyons; our woolen goods are inferior to none in the world. This may seem strange to people whose ideas of Russia are limited to a vast plain peopled by semi-civilized barbarians.

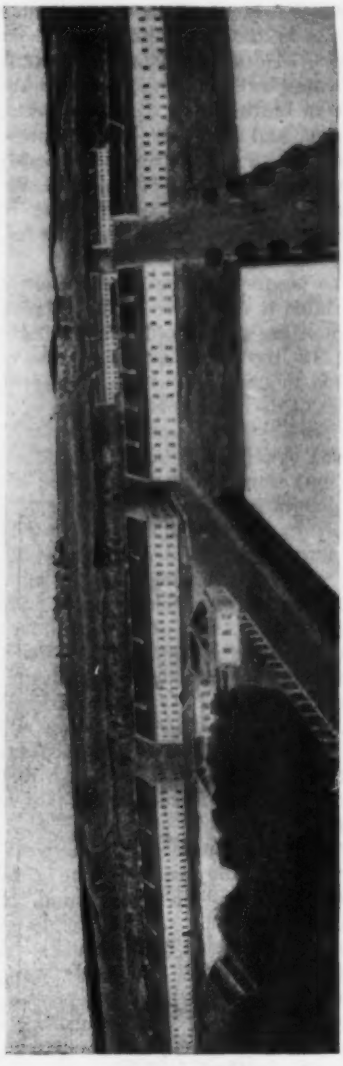
Even as far back as the middle of the 18th century, the manufacture of cotton cloth was carried on very largely from yarns imported from England. This manufacture was specially developed in the provinces of Moscow and Vladimir. But from the beginning of this century, owing to the rapidly increasing demand for cotton yarns, spinning mills sprung up one after another in rapid succession. Yet up to 1842, when the bill forbidding the export of textile machinery was rescinded by the English Government, the Russian manufacturers had a hard time fighting the difficulties connected with the equipment of their mills with the necessary machinery, and therefore, the cotton spinning industry at that time could not be considered to have been put on a firm commercial ground. Yet even a superficial review of the history of development of cotton manufacturing in Russia will show the wonderful rapidity of it during the last 50 years. In 1843 there were in Russia only 350,000 spindles, producing 36 English pounds of yarn per spindle per year, while at the present time there are 6,000,000 spindles with almost a double amount of yarn per spindle per year.

Alongside with the growth in the number of new and more improved—as to the equipment and management—cotton mills, both spinning and weaving, there is noticeable: (1) the enlargement of the existing mills in the way of increasing the number of working machines, the number of spindles and looms, with the replacement of old by new improved machinery; (2) the increase of the production, notwithstanding the variety of products; (3) the equipment of weaving, cloth printing and finishing mills with machines of Russian make; (4) the more and more increasing consumption of native grown cotton; (5) the replacement of foreign by Russian technical staffs; (6) the care taken by the mill owners about the improvement of the condition of their workmen as regards hygienic and sanitary matters and the elevation of the moral and mental standard of their workmen; and (7), as said in the beginning, owing to the improved quality, the Russian cotton products are steadily crowding out with great success the foreign fabrics from the vast interior market; and the export of home made fabrics to other countries is noticeably increasing, satisfying not only the substantial demands of the majority of the consumers, but often the most fastidious tastes of the fashion.

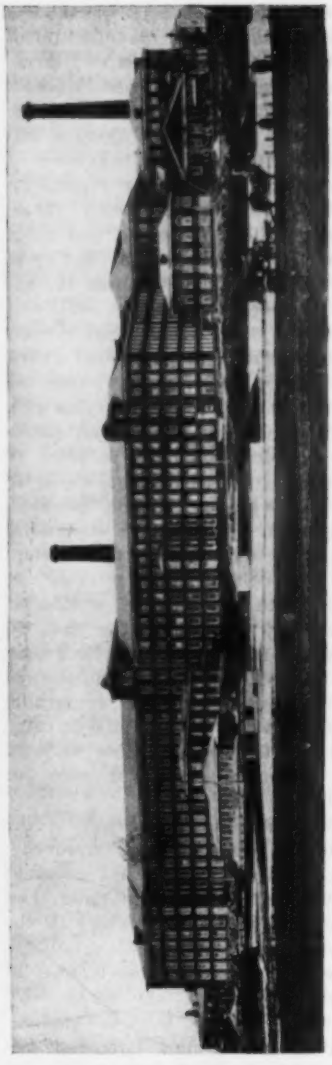
The progress in the construction of the mills is noticeable in the enlargement of the side openings for the light and in the introduction of weave sheds; in the introduction of electric light; in the improvement of the sanitary and hygienic conditions by introducing humidifiers and ventilators; the only thing which as yet could not be done away with is the noise produced by the machinery; and last in the introduction of means for preventing and extinguishing fires by automatic sprinklers, which is carried on to a large extent, being at the same time a means for the reduction of the insurance rate. The accompanying illustrations of the Great Jaroslavskaia Manufactura, the leading cotton mill in Russia, shows the striking difference in the appearance of a Russian cotton mill of to-day and that of thirty years ago.

Though the equipment of the weaving and finishing rooms of some of the mills is affected to some extent, by Russian concerns, the workshops of some of the largest mills are not satisfied by doing only the repair work, but have commenced to turn out complete machines for their own use. In many manufacturing centers like St. Petersburg, Moscow, Ivanovo-Vosnesensk and Lodz, special machine shops for construction of looms, printing and finishing machinery, have been started; yet as to the spinning and power producing machines, Russia has to depend entirely upon foreigners,

and chiefly upon England. The looms made in Russia are such crude articles, that really they could not be said to constitute a competition to the English looms. English machine manufacturers, it may be said, have monopolized the Russian market for cotton machinery, notwithstanding the fact that their machines, such as looms, spinning machines, warpers, spoolers, and slashers, are inferior in make and higher in price than those of American manufacture. It is a pleasure for me to state here that the experts from Russia, who have visited quite a number of American machine shops and cotton mills, declared unanimously that American machinery is far superior to any other in the world, in the make, finish, quality of material and ingenuity of construction. The most astounding fact stated by them is that in many instances the price of the superior American machines, delivered in Russia, is much lower than that of English machines, the excess



GREAT JARO LAVSKAIA MANUFACTURA.—As it appeared 30 years ago.



As it Appears To day

of freight from here to England notwithstanding. I would most emphatically advise the builders of American cotton machinery to turn their eyes upon the Russian market, and try to replace, if not entirely, at least in part the English machinery there.

It will not be out of place here to relate of the gigantic English trust, which has been retarding and is still retarding the progress of Russian cotton industry. Up to a very recent time almost all Russian cotton mills have been in actual servitude in the hands of the English, who have, so to speak, formed a cotton mill trust. The originator of the trust was a German from Bremen, who started his business in 1840 with a small commission house, engaged in the sale of cotton to Russian merchants. A large Russian firm gave him a trial order for spinning machinery, then other firms followed its example. The activity of this German commenced in 1842, when the export of machinery was allowed from England. The English machinery was usually accompanied by English engineers, workmen, etc., who were sent over to "teach the Russians." Little by little the small business of the German developed into a large firm which, in the absence of competition, became very important and independent. While furnishing cotton machinery, the firm did not lose sight of cotton, and soon monopolized that branch of the trade. When mills were equipped with English machines and Englishmen were put in charge of them and were running the mill, the cotton bought through the same firm, always was found to be satisfactory by the hirelings of the firm.

Gradually the firm became the only furnisher of American cotton for Russian mills. In 1850 it was an established fact that the prices of cotton for the Russian market were fixed by the firm and during the cotton crisis in the sixties, the same firm, being sole importer of cotton, dealt it out to different mills at its discretion, sometimes as a matter of favor. The firm understood very well that it had the upper hand of the manufacturers and became very overbearing and despotic. No new mill could be started without its interference, for it made contracts with almost all English machine firms, in virtue of which it became sole representative of them in Russia. When a man wanted to start a mill, he had to go to the head of the firm with a humble request to help him out with the equipment. The only question that was ever put by the manager of the firm was "what kind of goods the man wanted to manufacture." No details were allowed to be suggested, and if some bold man would venture to make a suggestion, he was promptly turned down with a sharp remark that "we know what is the best for you." If the man protested; he was shown the door, and his prospect of starting a mill would then vanish forever. All materials for the erection of a mill were ordered from England, even such cumbrous things as pillars and iron beams for the building, which could easily be furnished by Russian firms, were ordered from England. As an invariable rule, the contract of the firm with the mills would contain the condition of payment to be made partly in stock or shares of the mill. This would virtually put the mill under the control of the firm. The firm, whose original founder is dead now, uses the same tactics and methods as yet, its motto being "protection and introduction of English machinery." Such a state of things produced a most preposterous assertion that mills could be run by the English only. While at the present time, where the English are dispensed with, the mill shows larger dividends, is better managed, free from strikes, and better and cheaper machinery is introduced in to it from America or Germany.

(To be continued.)

Hosiery Notes.

LIMBACH — CHEMNITZ — LEIPSIG.

In Limbach there is a marked improvement in the circular knit goods trade, owing to big orders for socks and stockings from America. The

quantity and quality is satisfactory, but the terms so low that manufacturers are not able to see where the profit is going to come in. The exporters will probably find it hard to lodge these orders, unless accepted for the sole purpose of giving the men employment or getting rid of stock. In gloves, too, several orders have been received but not yet disposed of by the exporters. They either hope to reduce rates by withholding their orders from the producers, or by collecting large sums of such orders. The early arrival of the cold season gives hope of subsequent orders from retail dealers who expect a hard winter.

In Chemnitz the hosiery trade is still as dull as can be. With few exceptions there are no orders to speak of, so that the factories can only work with greatly reduced labor and shortest possible hours to prevent the accumulation of surplus stock. Fancy goods, in plaids and rings, as well as long stripes, prevail, and, although operations in this line have been extremely cautious, it is a favorable sign that fashion is taking this turn. The glove business is also slack. Only the better qualities are exported to America, and all the continental orders have been received. The usual plan of waiting till the last horn blows has been given up this season, owing to the rise in silk. Not much hope is placed in repeat orders from retail dealers who have a large stock on hand from last season.

The business in hosiery, at the autumn fair at Leipsig, was tolerable, in spite of very low prices. The demand covered principally hunting-waistcoats, stockings, sweaters and sport-stockings. The latter were especially salable. The same may be said of Scotch and tan-colored hosiery, which is now the fashion. Inland business for the coming season is not bad. The export business might be much better.

Max Wunchmann has a good silk finish for gloves which is expected to replace the taffeta glove. Fancies in hose are running well, especially for Christmas time. Greens went like hot cakes, but agents here have an idea that they are being overdone. Scotch plaids without embroideries sell now, and always will sell. Staples have gone at low to medium prices. Bicycle, cotton, cashmere, and silk plated hose with Tartan effects on the welt or fold are asked for in fairly large quantities; so, too, are bike footler's hose. Rumor reports a joint stock company to control the getting up of designs. Manufacturers fought shy of the enterprise; in fact, recent advices say they deluged it with ice-water.

C. J. BROWN.

Style Suggestions for Woolen Manufacturers.

There has been no season of recent years when it has been so difficult to keep track of the prevailing prices as this one. The steady and rapid advance in the price of wools and waste has caused a continuous change in that of fabrics.

The heavy-weight market will undoubtedly open with prices higher, relatively, than the present spring market, and the advances made in wages in the large manufacturing centers will be responsible for a further rise.

The business of manufacturers at present is largely one of guessing, to know what their competitors will open at, and the desire to allow the other man to be first, will doubtless make a later opening, which will aid the spring business in the way of getting goods made, before starting on heavy weights.

There are all sorts of rumors in the market in regard to the prices of new heavy-weight goods. It is said that the Washington Mills will open the old dollar kersey at one dollar and a quarter per yard, and that Riverside Worsteds will be priced at $2.25.

A review of the light-weight market often serves as an aid to the making of new prices on heavy-weights, and the following prices of this season's goods are given with this end in view.

In light-weights there was a large number of worsted and cotton fabrics in stripes, and one line of this character, shown by Raborg & Hyde, was

$1.15. Greeley, Frost & Cushman, had a line of worsteds at $1.30 and $1.20, and cassimeres at 82½ and 75 cents. Sawyer, Blake & Bramhall showed wool cassimeres at $1.37½, a line of short stock cassimeres at 85 cents, and worsted cheviots at $1.15. Stevens, Sanford & Handy, who handle all of Farwell's production, had worsteds at $1.95—less 5%, also at $2.00, $1.62½ and $1.57½, and worsted whip cords at $1.85. A line of cassimeres is made by Robert Blakie at $1.05, and the Pelhams at $1.00 per yard. Tillotson's worsted, the "Silver Lakes," probably the best worsted trousering fabric on the market, brought $2.12½—less 5%, $2.00—less 5%; the plain black grounds with white stripes were also $2.12½—less 5%. Sullivan, Vail & Co's worsteds were $2.07½, $2.12½ and $2.17½—all less 5%. F. Vietor & Achelis had wool cassimeres at $1.10 and $1.15. The Langham worsteds, with cotton made by Chas. Fletcher, were $1.25. The Oswegos, by the same maker in the Fulton mill, were $1.85. The Shannon's, $1.50. H Banendahl & Co. sold worsteds at $1.75, $1.42½ and $1.35; worsted cheviots at $1.10; imitation coverts at 90 cents, and a wool cassimere at 85 cents. Thos. Dolan & Co., sold worsteds at $1.62½, and worsted cheviots $1.40. A. D. Julliard & Co. showed worsted suitings at $1.47½ and $1.70. E. T. Steel & Co. had worsted suitings, largely in the brown shades, at $1.37½. Hardt, Von Bernuth & Co. had a line of worsted cheviots, made by Chas. Fletcher in the Saranac Mill, which were sold at $1.20. A line of cassimeres shown by the same house was 72½ cents. Washington mills, plain twills, $1.00; mix worsted twills, $1.20; serges, 89 cents, $1.00 and $1.05. Chester Woolen Co's wool cassimeres were 87½ cents and $1.12½; worsted cheviots in plain being $1.50; and fancy patterns, $1.75. J. & J. Dobson had a fine line of wool cassimeres at 70 cents. Springville worsted cheviots were $1.75 and $1.12½. Piece-dye worsteds: black, $2.12½, blue, $2.25. Blackington silk mixes, $2.50—less 5%. Globe worsteds were $2.87½, $2.75, $2.62½ and $2.50—all less 5%. Whipcords were $2.75, and fine shepherds plaids $2.75. Hockanum worsteds were $3.00, $2.87½—both less 10%; worsted cheviots were $1.75; piece dyes in blacks $1.50; blue $1.62½. Rock worsteds in stripes and checks, $2.62½. New England's, $3.00 and $2.87½—both less 10%. Phillips, Kunhardt & Allen, twist cassimeres and knickerbocker effects were 80c., 87½c., $1.12½ and $1.25; and Melton finish cassimeres, $1.50.

The Monarch cassimeres, made by D. W. Ellis & Son, of Monson, Mass., were $1.25. Peacedale cheviots, 70 cents; serges, 90c. and $1.20; undressed worsteds, $1.30 and $1.37½. Sangerville cassimeres, 85 cents; Clintons, 75 cents, and the United States Bunting Co. serges, $1.05. National worsteds, $1.67½; Lyndale's, $1.47½; and Fortunas $1.35. The Perseverance worsteds, sold by Stockton & Drowne, were $1.57½. Schaghticoke wool cassimeres with twist, at $1.00; and the plain weave Melton finish at $1.25. Vikings and Conger's wool cassimeres were $1.25, and the Piscataquis, also wool cassimeres, 85 cents. Broad Brook worsteds were $1.65; whipcord, $1.62½; and covert cloth $1.75. North Adams twist cassimeres were $1.45 and $1.55.

While the foregoing prices are given as those at which the goods were sold, they are not, in many instances, the present prices, as further advances have been made.

In the coming heavy-weight season there will be a decided demand for Scotch effects and plaids in worsteds and close finished cassimeres. The Globe Co. had some patterns in the present spring season which exemplify the tone of colors which will be required.

The cheviot and worsted cheviot fabrics are practically dead and the attention should be given to worsteds and wool cassimeres. Worsteds, with cotton, and close finish cassimeres will sell.

The Dry Goods Trade of New York.

The rage for plaids in silks, dress goods, knit goods, and about everything else, continues unabated. Silk

men find Roman stripes about as popular as plaids, which is saying volumes.

The Merchants' Association is planning for several future excursions.

Herbert Howard has transferred his allegiance from F Vietor & Achelis, to Bossert, Pere & Fils.

F. W. Binzen has opened an office at 43 Leonard St., where he will buy for the Pittsburg Dry Goods Co. He was long one of Marshall Field & Co.'s representatives.

Schnabel Bros. have secured W. L. Detmold who has been with Converse, Stanton & Cullen.

Daniel Denny of Denny, Poor & Co., died last week as the result of a surgical operation. He is survived by a widow, one son, who is in the firm's Boston branch, and two daughters. He began business with his father when the firm was known as Denny, Rice & Co. Later it became Denny, Jones & Poor, which resolved itself into Denny, Poor & Co., 28 years ago.

It is rumored that Mr. Williamson, of Cordner & Williamson, handkerchief importers, will soon retire. It is further said that J. Pedlow, now with Thos. Bell & Co., and another man, will go in with Mr. Cordner.

At the recent silk auction of Schwarzenbach, Huber & Co., prices averaged about 18% below agents' quotations.

Schnabel Bros. have secured Geo. Gifford, one of Whitman & Phelps woolen goods men, after January 1. E. V. Jacks and H. C. Calloway are also to enlist with the same firm on that date.

Shuttleworth Bros., brussels manufacturers, have shifted their selling account from the H. B. Claflin Co. to W. & J. Sloane.

Wm. J. Dillon, a western carpet man, has joined the ranks of Tefft, Weller & Co.

Wright, Young & Graham are to dissolve January 1. Mr. Young will retire to form the firm of W. Y. & G. T. Young, which will take the linen end of the business.

Walter H. Graeff & Co. are shortly to take the underwear and kid glove account now handled by W. Giddings, who is to have a connection with Graeff & Co.

R. J. Toye, carpet salesman with W. & J. Sloane, has gone over to Tefft, Weller & Co.

The Star Knitting Co. announces an advance in prices running from 15 to 40%, to take effect in November.

August Montant, with Schnabel Bros., is to soon have the selling account of the Rock Mfg. Co., which is to give up marketing its goods direct.

Three prominent South Carolinian mill men have lately visited this market. Ellison A. Smyth, president of the Pelzer Mfg. Co.; Maj. J. A. Brock, president of the Anderson Cotton Mills, and Col. James L. Orr, president of the Piedmont Mfg. Co.

J. G. Jenkins has gone to St. Louis to represent Carey, Bayne & Smith, the B. B. & R. Knight Co. and the Algonquin Print Works. He was previously New York agent for R. Granlees & Sons of Philadelphia.

Spielman & Co. have engaged J. C. DeCamp, formerly dress goods salesman with Hardt & Lindgens.

Sullivan, Vail & Co. are to get the dress goods and cloaking accounts of Stone & Vreeland.

E. N. Morris, late of J. T. Lowd Co., is now with B. B. & R. Knight.

L. L. Querean has been appointed resident buyer for the Syracuse Dry Goods Co.

Returned from Europe: A. R. Turner, of Barbour Bros.; E. M. Rathbone, of Passavant & Co.; J. J. Landauer, of Einstein, Wolff & Co.; R. Trompetter, of Fred Vietor & Achelis; H. M. Peyser, of H. M. Peyser & Co.; O. Von Bermuth, of Hardt, Von Bernuth & Co.; C. Muser, of Muser Bros.; F. H. Cozzens, of Cozzens, Elbers & Prankard; P. B. Worrell, of Fred Butterfield & Co.

The holiday business has begun. The lining business is uncommonly good. This is said to be because economy is moving many women to make over old gowns.

Jewish holidays never cut such holes in the market as lately.

Gone to Europe; F. A. Colt, of Wilmerding & Bissett; Henry Rice, of H. Rice & Co.; Isaac Stern, of Voss &

Stern; John Darling, of Hartmann & Darling; J. L. Batten, of Frocetzir, Pembroke & Co.; M. Loeb, of Loeb & Schoenfeld; M. Hesslein, of Neuss, Hesslein & Co.; J. F. Raymond, of the H. B. Claflin Co.; S. L. Goldenberg, of Goldenberg Bros. & Co.; L. F. Dommerick, of Oelbermann, Dommerick & Co.; J. Bussot, of Kahn & Kahn; G. E. Peers, of Lord & Taylor; Chas. Wiegand, of the H. B. Claflin Co.; E. Ries, of E. Ries & Co.; I. Brill, of I. Brill & Co.; F. Hoeninghaus, of Hoeninghaus & Curtis; C. R. Shaw; A. C. Griffith, of R. D. Warburg; R. W. King.

Leon Myer has gone from Loeb & Schoenfeld to Weil Bros.

The Wool Market.

The wool market has assumed a state of relative quietness, the natural consequence of the late activity, which all recognize could not last forever. The market, however, is firm, and prices are held tenaciously, with more prospect of their further advancement than decline. When lots can be obtained at a shade off, they are either defective or in the possession of some weak holder who is obliged to dispose of his wool in order to meet his financial obligations. Concessions cannot, however, be obtained from dealers who are in a position to hold their stock. Territory wools continue to be most sought after, especially the better lots. Montana wool brings from 18 to 22 cents per pound, or on the basis of about 52 cents clean. The extreme range for Territory wools may be quoted at 50 to 57 cents clean, the latter for a choice lot. Australian wool still remains firm, due to the condition of the market abroad, as well as here. As far as we can learn, very little wool was offered fit for American use at the recent London sales; hence, little was purchased for our markets. Combing Australian, in our markets, is quoted at 70 cents strong for the choicest selections, for both combing and clothing grades. The market for carpet wools is strong, and prices are advancing, with Aleppos at 12 to 13 cents. The wool market is sustained by the excellent condition of the woolen goods trade, affecting both men's wear and dress goods.

Cotton Market.

At present writing, the price of midling uplands is 6 3-16 cents, against 6⅞ cents a month ago. The yellow fever scare in the South has greatly interfered with the movement of cotton during the past month, which has affected very sensibly the receipts at the ports, which have run about 250,000 bales short, up to date, as compared with the receipts last year. Northern spinners, however, have taken about the same amount of cotton, thus far, as last year, while the Southern mills have exceeded their takings. The trade, however, are evidently operating under the idea that the present crop will be a large one, and that prices, though extremely low, will not advance very materially. Opinions, however, on this point, differ, as is always the case at this time of the year. The president of the New York Cotton Exchange has given out the contents of a number of his advices from his Southern correspondents, who have estimated the size of the crop with an average result of about 9,500,000 bales, at the outside. The most interesting estimate that has come to our hands, of late, is the one by M. H. Gunther & Co., Memphis, Tenn. This concern has arrived at very close estimates of the cotton crop in previous seasons, and their figures at the present time are looked upon with special interest. They estimate the production at 9,638,950 bales. "With the world's requirements," they say "of fully 9½ million bales of cotton, we regard values as too low, and that after the pressure of receipts has passed off, we must see a material improvement." The latest advices from Alexandria state that the arrivals of Egyptian cotton are not heavy, as yet, and the higher grades are relatively cheap. The weather continues favorable, and the crop is opening well.

COTTON DEPARTMENT.

Leno or Gauze Weaving.

(Continued from September number.)

We illustrate, herewith, a very much larger diamond (Fig. 15). In this weave we have three doup picks and three crossing picks with six picks of plain between; we also have 4 double ends crossing each cord. It will be understood that the more double ends we have crossing the cord, the further apart the cords will be at the crossing picks, and the shape of the diamond will then be decided by the number of picks between the doup and crossing picks. You will also notice that the crossing threads, instead of remaining down on the doup and crossing picks, as in Figs. 8 and 11 (see September issue) are continually weaving plain. But of course there would be two double ends down at the time of crossing, and these would be strong enough to hold the cord, and would also help to keep the cords apart. In this weave, having 4 doubles, or 8 single threads crossing, and the cord about 6 ply, which would be equal to 14 single threads, we could not expect that they would weave well in a single dent of the reed, as they would be too crowded. So we must not only leave empty dents between the cords, but must pull out one or two dents of the reed and so leave a space equal to two or three dents. Then the crossing threads, weaving plain all the time, would not only weave well, but would remain straight, and the cords would be held apart. The drawing in draft for the weave at Fig. 15, is shown at Fig. 16, and the chain draft at Fig. 17. Fig. 15 is shown as being woven on 5 harnesses besides the doup set, but with the crossing threads weaving plain all the time it could be woven on 3 harnesses beside the doup set. Figs. 8, 11 and 15 are shown as they are woven in the loom, the wrong side of the cloth up, and with the doups tied to the lower shaft of the half harness.

All the different leno weaves are woven wrong side up, with the doups attached to the lower shaft of the half harness. It was considered to be impossible until recently to weave these leno patterns right side up in the loom, and the writer claims to be about the first to weave any of these leno patterns right side up successfully.

So that these half leno weaves can

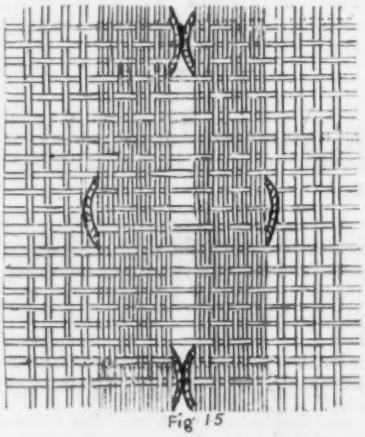


Fig 15

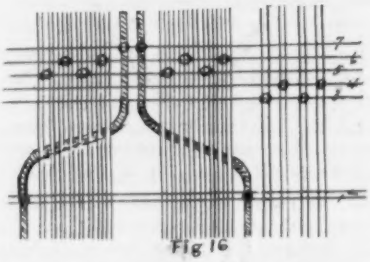


Fig 16

be and are woven right side up with the doups attached to the upper shaft of the half harness. It will be readily seen that these doups being tied to the upper shaft of the half harness will be in full view of the weaver all the time, and the doup can not only be tied in quicker, but the weaver will detect them before they wear completely out, and so prevent bad places being made in the cloth.

Fig. 18 illustrates the half leno

weave of Fig. 15 as it would appear if being woven right side up with the doups on top, the cords being simply held up for six picks and then dropped for three picks.

In tieing in the two doups for Fig.

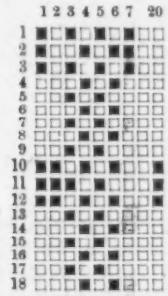


Fig. 17.

18, we pass one end of the doup through the lower half of the heddle on the standard harness, and the other

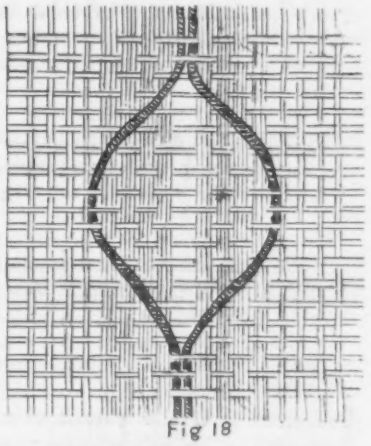


Fig 18

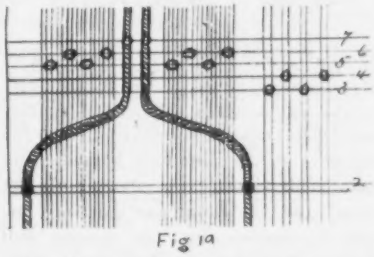


Fig 19

end through the eye of the heddle, from left to right, then tie the two ends to the upper shaft of the half harness; the eye of this doup is then pointing to the left, and is a left hand doup. The right hand doup is threaded the same as the left, but passed from right to left. The drawing in draft for Fig. 18 is shown at Fig. 19. You will notice that the only difference between this and Fig. 16 is, that the cords instead of passing under the crossing threads and through the doups, pass over the crossing threads then through the doup. At Fig. 20 is shown the harness chain for

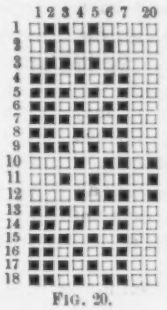


Fig. 20.

Fig. 18. You will notice that it takes just 30 more pegs to make this chain than Fig. 17, and this is one of the objections to weaving these half leno weaves right side up. In my next article I shall take up and treat on the "full leno" weaves. DOUP.

Bad Yarns and their Causes.

M. M. BUCKLEY.

(Continued from June.)

[In the author's previous article, the subject of counterpoise weights was considered, as employed in the weighing of the stock for delivery to the first operation in carding. The disadvantage and liability of errors, in the use of the same material as the stock itself, for such a weight, was discussed, and held to be more ideal than practical, and long ago discarded as most unsatisfactory.—Editor.]

Turning, now, to the use of fixed weight for this purpose, we at once admit that it is not an ideal system, still it is practically the only alternative. We are placed between two evils and must choose that which is the least injurious. All aspects considered, we are inclined to regard the fixed weight system as, in our experience, yielding the best results. It is

only possible for one factor to vary, and from observations and tests we are inclined to place the amount of loss at from 2 to 8 or 10 per cent., according to the class and quality of the material. It is impossible to give any exact data, because the capacity for absorbing and retaining moisture varies so much in the different textile fibers, and even in different qualities of the same material, that it would need a very extensive and elaborate series of experiments to settle all the questions. Results which are sufficiently reliable may be obtained by a comparison of the results of the two methods with regard to standard count, and we have always found the fixed weight to be the best.

At every operation previous to spinning, everything which tends to make the yarn more regular should be adopted. The presence of very short fibers is always a source of weakness and a frequent cause of irregular yarns. Hence, they should be removed by some process of combing, which also cleans the surface of the fibers to be utilized, making them much more suitable for spinning.

One point which needs supreme attention is the constant tendency at every operation for a certain amount of breakage to occur, owing to the great longitudinal strain, which is placed on the fibers, resulting very often, to a great extent, from the faulty setting of the essential parts of the machines. The more we can preserve the length, the more closely shall we approach to the ideal thread, and the necessity of carefully adjusting the various rollers to the length of the material to be worked should be impressed upon those in charge.

Another factor which exercises considerable influence upon the character of the yarn, is the number of the doublings which the material receives in passing through the preparatory operation. It will be easy to see that the more numerous they are, the more completely will the fibres be mixed, and in some systems of spinning a series of machines is used with the special object of obtaining as large a number of doublings as possible in conjunction with a reduction in the thickness of the ends, so as to form a roving, suitable for spinning.

Yarns may be defective in three ways: 1st, through irregularity or unevenness; 2nd, faulty twist which affects the strength; 3rd, incorrect weight. Any or all of these may be present in a yarn and they may be local, that is, confined to one particular bobbin or spindle, or general, as exhibited by all the bobbins which are made. The first class, or local faults are, as a rule, the most difficult to deal with, because they often arise from something which is very easily overlooked, for instance, deficient lubrication of a roller or a spindle is frequently responsible for many defects of this kind; or again, if a loose carrier is not properly replaced, the yarn is made twitty, a bit of waste in the spindle bearings or a slack band will cause soft twist. In fact, there are a hundred and one factors which contribute towards the making of local defects. All the machines should be periodically overhauled and levelled up, the joints and bearing, when worn, replaced. Especially does this apply in the case of small rollers where the different lengths fit into each other and are connected by a pin. The latter very often gets worn down, and then the roller begins to slip and holds the ends instead of taking them forward. Attention should be given to keeping all the moving parts well oiled, either by means of tallow or oil.

Irregular or uneven yarn is a fruitful cause of much trouble, and since it may be produced in a variety of ways, it is often difficult to discover by what means it has originated. A careful examination of the defects will very often enable us to detect their cause and remedy them, but here a rigid rule should be observed, that no alterations be made of the machines or any of their wheels, until we know why we do it and what will be the effect of the change, or we may bring additional faults into existence. In all cases, the roving, from which the yarn is to be spun, should be critically

examined to ascertain if it is in any way defective, because we can never expect to obtain a superior yarn from indifferent rovings. And, since they are often of vital importance, we should know where to look for them. It is a frequent occurrence, especially where carriers are used between the drafting rollers, to find thick ends at indefinite intervals, for which no cause can be assigned. If a careful watch be kept on the hands attending the roving frames, when putting down the ends, it will be found that, in order to get them into the front rollers, they remove the carriers while the machine is running. The effect is that all the twist is let out of the remaining ends, and their short fibers not being retained, are carried forward bodily, leaving a thin place with a corresponding thick one of considerable length, made when the partially broken end reaches the rollers. The remedy is obvious. Insist upon the frame being stopped before the carriers are removed. We have known this to cause endless trouble and claims before the reason has been discovered.

Another frequent fault is unsuitable twist. If too soft, the individual fibers have not sufficient hold upon each other to resist the pull of the rollers, and consequently twitty places are the result, while if made too hard, they break instead of drafting. A careful lookout should be kept for bad roller rovings, that is, bobbins made by a faulty roller, whose leather may be either loose or grooved. In the first instance, if the breach extends across the boss, a bad place will be made at each revolution; while in the latter, it only occurs each time the traverse motion brings the ends to the particular part of the roller, generally situated at the end of the pick. This defect in the roller often arises from want of oiling, which causes the ends of the arbor to get dry, and, therefore, exercise considerable friction on the bearings, and, consequently, have a tendency to lose their speed, especially if the weight by which they are pressed against the bottom roller happens to be insufficient.

To secure regular drafting, it is absolutely necessary that the rollers should have sufficient pressure on them to prevent the ends being drawn through without any drafting; for instance, if the feed rollers do not hold the ends, they are simply drawn straight in from the bobbins, and choke or groove the delivery rollers; while if these are not properly weighted, they refuse to draw the fibers and soon become damaged and useless. Their setting in relation to each other is a matter of importance, because if the space which separates them be too short, many of the longest fibers will be broken, and a source of weakness in the yarn will be introduced, because its strength is to a great extent dependent on the length being preserved. Again, the weight of the rovings must not be overlooked, as it often happens that a bad yarn is made through spinning from rovings which are too heavy. In all cases they should be made suitable for the counts they are to be spun to, since the draft, if too long, produces irregular places. It is always better to have the rovings too light rather than otherwise.

When every thread from the spinning machine exhibits a succession of thin places at regular intervals, the wheels, which drive the rollers, should be minutely examined, to see that they are properly geared and also that none of the teeth have been stripped off. Invariably it will be found, that this is the cause of the defect; sometimes 3 or 4 teeth get broken in one of the drivers or intermediate wheels, and each time they come round, a slight stoppage of the delivery rollers occurs, and the ends are unduly drafted. If all the ends are more or less twitty, it will be found very generally to arise either from unsuitable draft, faulty setting of the rollers, or the rovings being too soft in the twist. It is of the utmost importance, in order to produce a good sound yarn, to employ a suitable draft. This, in the first instance, is governed by the character and peculiarities of the material in use. Fibers of good length, which are strong, soft, and elastic will allow of

more draft, than when these features are absent.

Again, the external structure of the fibers is a factor which materially influences the spinning quality as seen in the twist of cotton and the serrations in wool. All other things being equal, those filaments having the roughest surface will spin the best, owing to the greater resistance offered as they are drawn over each other. It will be obvious that in considering this question, the length of the staple must be taken into account, owing to the fact that the longer the fibers are, the greater will be the number of times they are wrapped around each other, and consequently more force will be required to draw them forward. For this reason, is it usual to set the rollers rather further apart than the longest fibers. A long shafty fiber will require a series of drafts, altogether different from those suitable for short material, and, generally speaking, we may say that the longer the filaments are, the more draft it will be necessary to put on. As the material is passing through the successive preparatory operations, it ought to be drafted, first in one direction and then in the other, so as to ensure the proper amalgamation and distribution of the long and short fibers. When drawn two or three times in the same direction, and especially if a long draft is adopted, it has a constant tendency to make the ends twitty, owing to the shortest fibers being pulled forward by the longest, when they are seized by the rollers. All lines of rollers and carriers must be set perfectly straight or they will have a tendency to jump at the joints, and this strains the yarn. No laps or accumulations of waste ought to be allowed to remain on any of the rollers as they will lift the upper roller and reduce the pressure, which should be available for drafting.

—There is no reason why a picker should not make just as good a lap at the end of five years as it did the first month, but it must have care.

The Northrop Loom.

We give herewith, an illustration of the latest design of the Northrop loom, made by the Draper Company, Hopedale, Mass. This loom was fully introduced to manufacturers about two and a half years ago, after it had been long experimented with by the makers, and large sums of money expended towards its perfection. The machine is already recognized as a wonderful production of the ingenuity of man. It has marked an era in cotton manufacturing, and events relating to the cotton industry will be dated, in many instances, from the introduction of this loom. The greatest weakness in the system of manufacturing has been the labor cost of the production of the loom. This loom goes far towards reducing this cost to a minimum. The new features about the loom, as here represented, consist, in part, of a new frame with stiffer sides, greater width between sides, and larger feet. The arrangement of a number of parts of the loom has been changed so that all parts are one hand, except pulleys. In the illustration it will be noted that the shipper is on the opposite side to the pulley. The latter, however, can be placed on either side without disturbing the rest of the loom. It may be well to state to those who are not familiar with this machine, that the principal features are the shuttle, the transferer, the hopper, and the filling fork. The shuttle has an open bottom, and holds the bobbin by means of spring jaws acting on large metal rings attached to the bobbin base. When a new bobbin is put in, it crowds the spent one out, the latter falling through the bottom of the shuttle on to a guide which delivers it into a box. The shuttle has an incline, and several notches in the springs, so arranged as to permit a bobbin to be put in when the shuttle may be in various positions, according to the wear of the picker, or its rebound, etc. A new lay has been added to the machine with adjustable reed fighter, longer shuttle boxes, and new binder adjustments. A new cut motion, with metal take-up roll, has

been added; also a new take-up motion, which is positive and simple, likewise a Bartlett let-off with new friction clamp. There are other new features connected with the loom, as the Stearns pick motion, new filling brake, with new brake shoe and new brake adjustment; new beams, with turned face on heads and machine moulded gearing, new harness adjustments with hand tightener on jack, a new slot protector or bobbin chute, stationary and attached to lay; a new thread cutter, attached to the temple, preventing fringe on hopper side of selvedge; a new warp stop-motion, having new shape for detectors, new vibrator, gravity method of operation, automatic setting, positive action on shipper-handle; and a new hopper, having new shuttle position detector, now attached to the hopper itself.

The hopper will be noticed in the illustration as at the right of the loom, circular in form, with the rotation of which the bobbins of filling are delivered at the proper time into the shuttle. The lay on each alternate forward stroke brings the shuttle directly under the hopper, where a simple movement of the transferer, or pusher, effects the desired operation when necessary. The loom is now well balanced, each part doing its work properly and efficiently. The present capacity of the company's loom department is one thousand looms per month.

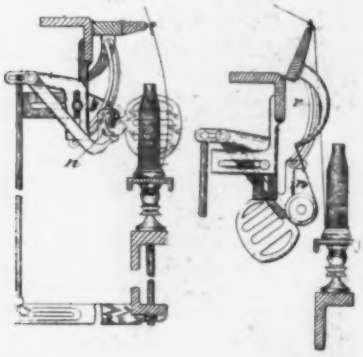
—If 1-inch staple is the standard, the proper distance for beater from feed roll is ¼-inch.

NORTHROP LOOM.

Yarn Separator.

We illustrate herewith, a device patented by a well-known inventor, of Fall River, for facilitating the removal of separators from between the spindles and holding the thread board up and out of the way at the time of doffing, or taking the full bobbins, or cops, from their spindles; and for replacing the separators in their operative position between the spindles, after the empty bobbins have been placed upon the spindles; and for actuating and varying the limit of the traverse of the separators. It will not

be necessary, we think, to refer to the illustrations in great detail, as they will be readily understood, so far as they relate to the objects of the invention. We will state, however, that the separators move up and down in practically synchronous correspondence with the laying of the threads on the cop, this motion being accomplished by a suitable connection from the builder-shaft, which has for that purpose a suitable reciprocating rotary motion. To make some parts of the device clearer, we will refer to the letter "r," which denotes the swinging connection hung to the thread-board and loosely attached to the retainers "n" by means of a projection,



they being of suitable length so as not to interfere with the reciprocating of the separators.

When the operator is ready to remove the bobbins or cops, he throws the thread-board upward. This action, through the medium of the swinging connection, raises the retainers "n", loosening their hold on the separator-bar, which then, under the weight of the separators, drops downward and away, so that the separators pass from their operative position between the spindles, leaving the whole field free to permit the operator to remove the bobbins.

—For the advance and great improvements made in picking machinery during the last ten years, we owe much to the introduction of the revolving flat cards.

Cotton Picker.

Among the many inventions for picking cotton mechanically, the following is a description of a recent invention which has for its object that of picking cotton from a field in order to do away with hand labor, and thus effecting an important economy in the labor required in harvesting the crop. The invention in its general features is a frame on wheels, so constructed as to be readily moved over the field, and provided with picking devices, in the nature of endless bands, arranged to engage all the bolls of the cotton plants, and remove the fibre therefrom. It is so constructed that the plants are delivered to the picking mechanism, the latter being so made as to yield and accommodate itself to the various positions of the plant.

In operation, the machine is driven along a row of plants, the horses, two of which are employed, walking in the furrows, at the sides of the row, the plants being pressed between the picker-cloths or guides, at the forward end of the frame, where the cloths are farthest apart, and are gradually compressed between the cloths and the spreader until they emerge at the rear part of the machine, where the space between the cloths and spreader is reduced to a minimum. The cloths or aprons, being in rapid movement, engage with and remove the cotton from the bolls of the plants and carry it upward over the rollers or drums, when the cotton is removed from the cloths by cleaning-rollers, and delivered into the hoppers. Rakes play in these hoppers, discharging the cotton from the latter into bags or receptacles placed to receive it.

A machine constructed as described is represented as being extremely simple, durable, and inexpensive, and very effective in operation. The cotton, when picked, is free from dirt or foreign matter. We have heard of no trials of the machine on the plantation. The inventor lives in Arkansas.

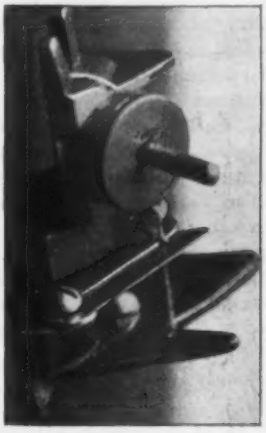
—Some of the newest designs have floated weft figures introduced.

A New Device.

TENSION YARN GUIDE AND SLUB CATCHER

The Sanford Manufacturing Co., Fall River, Mass., have placed on the market a guide, combining a slub catcher and a tension device, where, by the changing of weights, the tension will be varied according to the number and strength of the yarn, and the certainty of removing all bunches or other imperfections which increase the size of the yarn. The value of this will be understood when it is remembered that different numbers of yarn running on a coneing machine require different degrees of tension.

A casting is made with a bearing for



the yarn, which runs on an incline under a washer or weight of different thicknesses, but of the same diameter, to give the required tension. This weight revolves slowly around a pin in the casting as the yarn runs through, which has a tendency to roll, as it were, the loose fibers of the yarn, making the same round and smooth.

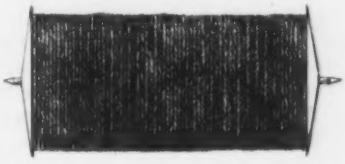
Just beyond this, and on a line with the first bearing, is a support or guide which keeps the yarn from wabbling or vibrating as it passes through the slub catcher, which is placed between the two supports or guides, and consists of two pieces of sheet spring steel, made with hemispherical edges, and adjusted so as not to touch, but come as near as possible to the yarn, as it passes through it, so as not to chafe or injure the yarn.

The operation is as follows: The yarn is taken from cop, spool or bobbin and passed under the weight through the slub catcher and guide to the drop wire of the stop motion, thence to the coneing device of the machine proper.

A bunch, mote, seed or leaf in the yarn, as it comes to the weight—which, while revolving, pushes the object to one side, if the obstruction is very large or is twisted into the fiber yarn—passes under the weight and brings up against the spring edges of the slub catcher, breaking the yarn with a snap, without stretching it and takes the tension off the drop wire, stopping the cone. The end is then pieced up anew by the operator, and the slub or bunch removed. Clearer and better goods are the result.

Cotton Baling Apparatus.

We illustrate, herewith, a recently patented so-called cotton bale, in its complete form after being taken from the machine and ready for shipment. What the inventor expects from his device we can hardly make out, and refer to it at this time as a novelty in the many efforts to improve the methods of baling cotton. The method relates not only to the form of baling, but to the apparatus or compress which produces it. The apparatus, or compress, receives the cotton directly



from the gin, and condenses it into a rope, to be wound upon a spool, as seen in the illustration. The object of the invention seems to be that of providing a machine so constructed as to twist and compress the cotton at the initial point of ginning, and continuing the operation with that of ginning, so as to avoid the expense and labor occasioned by the handling of the cot-

ton during its storage and transportation to some neighboring compress, and also the expense of its compression, while at the same time producing such condensation of the cotton as will secure the cheap rates of transportation accorded to cotton which has been compressed to the standard degree of density. The patentee appears to be aware that machines have already been devised to compress the cotton as it is delivered from the gin.

The Cylindrical Cotton Bale.

A TRUST.

The "Times-Democrat," New Orleans, has been trying for sometime to create a prejudice against the cylindrical cotton bale, as being inferior in every respect to the common square bale. Its chief attack, however, is upon the American Cotton Co., that controls the compression of this bale, and which, it is said, is rapidly becoming a mighty organization, or trust that will sooner or later result in great injury to the cotton industry of the South. The cotton factors and brokers of New Orleans are, in many notable instances, protesting against this form of bale and against the methods pursued by the American Cotton Co. for obtaining the control of the cotton compressing of the South. We do not wish to impeach the motive of the cotton trade of New Orleans in their opposition to the company and its bale, but it is very evident in the interviews that they have submitted to, and which have been published, that they fear a loss of prestige and of business should the American Cotton Company carry out its schemes. The effect of this innovation of compressing the cotton in a cylindrical form, on or in the immediate vicinity of the plantation, will be to destroy in a considerable degree the business of cotton factors at the great central points of shipment and the compresses there located; and also the local cotton buyers in the interior towns will lose much of their vocation. In other words, the whole system of cotton buying, as at present conducted, will be revolutionized and in a measure paralyzed, and new trade factors will arise. Much of the fear that is expressed is not without foundation. In fact it would prove detrimental to the planting and other interests in the South engaged in the cotton business, should a trust arise to control the handling and distribution of the cotton crop. A monopoly is always repugnant, no matter how much benefit it may bestow upon those most concerned.

Better Handling of Cotton.

Members of the cotton trade have received copies of a circular letter issued by the Galveston Maritime Association, advocating better baling and handling of cotton. The circular is addressed to the farmers, ginners, and all parties handling cotton in Texas, and follows:

The marine insurance companies have issued a new tariff on cotton; the rates are ¼ per cent. higher on cotton raised in Texas than on cotton raised in any other State.

Placing the value of a bale at $40, the increased cost is 10 cents per bale, or $300,000 on a crop of 3,000,000 bales.

Who in the end pays this enormous sum of $300,000?

The only answer is the Texas farmer.

Just think of it—an actual loss equal to the value of 7500 bales of cotton, caused by negligence, and who is at fault?

The loss of $300,000 can be prevented by the farmers, cotton dealers and compress managers taking better care of the cotton, and never letting the bales rest on the ground, nor be exposed to the weather. Heavy bagging 2½ pounds, and certainly not less than 2¼ pounds, should be used, and skids should be placed under the bales when it is not possible to keep them in warehouses.

If the interior of the State will protect cotton as it is done in Galveston, the question of "country damage" will be settled, and the farmers will receive $300,000 more for their cotton.

WOOLEN DEPARTMENT.

Science and Practice of the Construction of Woven Textures.

F. BRADBURY.

(Continued from October.)

Any attempt to increase the natural number of warp or weft threads will cause a decrease in the relative number of the opposite set of threads, as well as a decrease in the angle of curvature in those threads. Thus, when the warp is made to produce an angle of 45°, when both warp and weft threads are bent, the weft will produce an angle of 22.5° (Fig. 9), and if the warp produces an angle of 60° the weft will form one of 15° (Fig. 10).

But if one set of threads be made to lie perfectly straight, the opposite set will produce an angle of 45°, that is, assuming the threads are put as closely together as the angle of curvature will permit (Fig. 11). (Fig. 8 is described in the October article, to which it would be of advantage to refer.)

If the warp lies perfectly straight, the weft may, and occasionally does, in practice, produce an angle of 30°. In such cases the fabric is not woven as closely as the diameter, etc., permit. The warp and weft threads can each form equal angles of less than 30°, but then the cloth will be looser in proportion, which may, or may not, be detrimental, according to the class of material which is being made, and the purpose it is intended to serve. When the above is desired, it is frequently advisable to use a looser spun yarn, as is often done in the manufacture of dress goods where a mule-spun yarn is used in preference to a throstle-spun yarn, as it has a greater diameter for the same weight and length, and it also produces a fuller and softer handle together with a relatively lighter cloth. The relative increase and decrease of the number of warp and weft threads in the fabrics, due to all the above variations, will subsequently be explained in detail.

Fig. 8

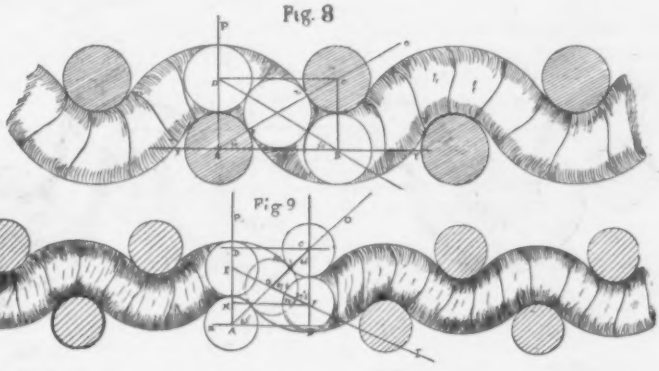


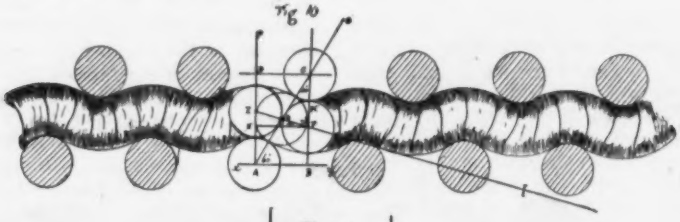
Fig. 9

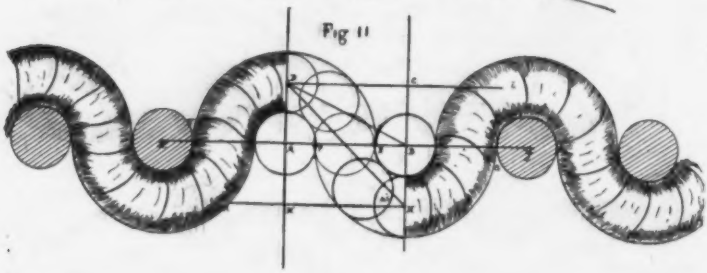
By the application of elementary geometry and trigonometry, we may very easily determine the number of warp and weft threads which the fabric (Fig. 8) should contain if made under natural conditions, but perhaps it will be best to first describe the construction of Fig. 8 upon the horizontal line "XY," of any length; take any point "A," and describe a circle representing a cross section of the warp. Describe an arc "mn" with radius of "A-|-" diameter of weft. Draw a perpendicular line meeting "XY" in the center of thread "A." From point "A" draw "A O," making an angle of 30° with "AB." Then, upon the straight line "AO" describe a circle "C" of the same radius as "A," and so that its periphery shall touch the arc "mn" at "n." From "C" draw a line at right angles to "XY"

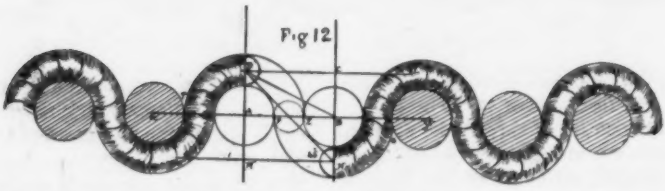
meeting "XY" at "B," and from "C" draw a line at right angles to "CB," joining "AP" in "D." Then from center of thread "C" describe an arc of a circle "rs" with radius "C+" diameter of the weft.

Sides "A B C D" now form a perfect rectangle, and a straight line drawn through the centers of the weft at "B" and "D" reveals the angle formed by the weft to be one of 30°.

It is now necessary to find the distance from "A" to "B" or "D" to "C", which represents the amount of space that one warp thread, plus one intersection of the weft, must occupy in the woven piece.







By construction we know that the distance from "A" to "C" equals two diameters (1 warp plus 1 weft), as is also the distance from "B" to "D," being diagonals of the same rectangle. Assuming the diameter of warp and weft threads to be 1-60th of an inch, then distance "BD" = 1-60 + 1-60 = 1-30 inch, and distance "AD" equals half the diameter of warp and half the diameter of weft, = 1-120 + 1-120 = 1-60 inch. Let "X" equal distance from "A" to "B." Then in the triangle "A B D," and knowing "cosine" of an angle to equal base divided by hypothenuse, we proceed as follows:

$\frac{\text{A B (base)}}{\text{B D (hypothenuse)}}$ = Cosine of angle,

A B D = Cos. 30 degrees.

And Cosine $30° = \frac{\sqrt{3}}{2}$

$\therefore \frac{\text{A B}}{\text{B D}} = \frac{\sqrt{3}}{2}$

$= \frac{X}{1 \div 30} = \frac{\sqrt{3}}{2}$

$= 30X = \frac{\sqrt{3}}{2}$

$\therefore X = \frac{\sqrt{3}}{30 \times 2}$

And $X^2 = \frac{3}{3600} = \frac{1}{1200}$

$\therefore X = \frac{1}{34.6}$ inch.

= distance from "A" to "B,"

that is, the diameter of one warp thread plus one intersection of weft, equals one thirty-fourth part of an inch, or the fabric would naturally

contain 34 warp threads per inch if the angle of curvature of warp and weft be 30°.

This same result can be obtained by the application of a proposition in Euclid, but by adopting the trigonometrical method, any problem of this kind can be most readily and correctly solved.

(To be continued.)

Comments on F. Bradbury's Propositions.

Editor Textile World:

I am always averse to taking exception to anything said by contemporaneous writers on textile technology, but I cannot refrain from taking exception to two remarks made by F. Bradbury in his article on the "Science and Practice of the Construction of Woven Fabrics."

In speaking of the angle of curvature of the warps and weft in a cloth, he says "Writers on technical subjects have occasionally referred to it, but no one, so far as I can discover, has thoroughly explored this section of textile work," etc. Then, later, he shows that "The average angle formed by the weft is one of 30 degrees," and further says "I have known such an angle to be expressed as one of 60 degrees, but I would point out that it is not possible to construct a fabric where the warp and weft shall each form angles of more than 30 degrees in single make texture."

I should not have troubled you on this matter but for this last quotation, which is evidently intended as a direct slight upon myself. I first made public this theory in the Mechanic's Institute in Bradford (England), I think, in the year 1880, and showed diagrams from actual cloths to illustrate the angle of 60 degrees. I afterwards published it in my "Treatise on Textile Calculations," and elsewhere. I published the first table of the diameter of threads upon which the cloth structure rules are built, and upon which Mr. Bradbury works. I made the deduction at the same time as a German gentleman, with whom I was in correspondence, of finding the diameter of threads by extracting the square root of yards per pound. I worked out the density of an ordinary commercial thread in consequence of a letter I received from T. F. Bell of Belfast, to whom must be given the credit of first suggesting, and practically demonstrating it.

The angle of 60 degrees of which I speak, is the angle of curvature which is presented to the eye, and the one which should be spoken of. Mr. Bradbury covers himself by saying "The angle formed with the horizontal." He surely must know that if there is one angle of 30 degrees in a right angle triangle, there must be one of 60 degrees also; and if the 30 is in the horizontal, the 60 must be in the vertical.

It would be interesting if Mr. Bradbury would give the public the benefit of his methods of measuring these angles, as I have done over and over again, and also say where he got his first data.

T. R. Ashenhurst.

Wool Carding.

There are few machines that are called upon to produce such uniform results from a great variety of material and under varying conditions, and at the same time accomplishing a complete transformation, as the woolen card. Therefore, methods must of necessity vary under differing circumstances and conditions. Consequently successful carding of wool calls for good judgment, quick perception and a general ability,—no more perhaps than is needed for any other department or business, either in or out of the mill; but there is certainly no other portion of mill work that requires more constant attention and endeavor from an overseer, to insure uniformly good results. The wool carder is expected to turn out a good and sufficient quantity of product, oftentimes with little consideration to previous preparation of the stock.

The stock should be properly mixed and prepared, in order that good results may be obtained, for in the process of carding the stock is subjected

to its first mechanical operation. It is very evident the result of these operations will bear seriously upon subsequent operations, and finally upon the fabric.

Upon the uniformity of the roping produced from the finisher card, depends the uniformity of the spun yarn. It has been truly and justly said by an old manufacturer, "give me a well equipped carding room with a first-class carder, and the production of that mill will be A-1."

As in other matters, so in wool carding, it requires thought and very careful attention to work out practical results. We may say, that the carder who has never had anything but nearly equal mixtures of wool and cotton to work with, will be unable to understand why others are troubled with electricity. Those who card all white cotton or fine clean wools, will scoff at the advocates of frequent grinding, while they who work dirty wools, waste, shoddies, etc., will find themselves obliged to put the emery to their cards very often, and prefer to have their cylinders run at a slow speed, in order to keep the stock from dropping under the cards.

There are certain fundamental rules that must be observed, such as having the cards true and level, and the card wire ground to a certain point.

The card room is an expensive department in which unnecessary changes are sometimes made. This should be borne in mind and should be well considered by the young carder, that when it is once filled and fitted there is little chance for any change. The cards will last an indefinite number of years, and the clothing should seldom be changed unless it be past use. Of course, there are things which sometimes become so absolutely necessary that a change should be made. A proper respect to these facts account for the great and deserved reputation of some of our best carders. They have followed the business, perhaps, on one line of goods for years in the same room, with their machines adapted to this particular work and, having made it their life-study, they have become successful men. They avail themselves of every real improvement, and thus have become experts in this, their special line of wool carding.

There are mills that are compelled to make a wide range of goods, oftentimes, at the same time, heavy and light, coarse and fine. Occasionally lines must be changed. Then it is that the carder requires a versatile knowledge and experience to meet possible emergencies.

Some claim and speak of the carding-room and of carding as a sort of preparatory operation. But we claim for it a higher importance because of the fact that imperfect work once made in the card room cannot well be remedied in the after processes. It must be borne in mind, however, that it is not the first process that the stock is subjected to. The stock can and does receive irreparable injuries before it reaches the card room. Even when the stock reaches the mill in good condition, it is by no means certain that it will remain so up to the card room. Good stock has been frequently ruined by improper scouring, or it can be greatly injured in the coloring, as in the use of inadequate or imperfect picking machinery, or poor oil or emulsion may be improperly applied, or be in poor working condition.

If the carder had only such stock as came to him in perfect working order to handle, his duties would be much more easily mastered: or, if it were not necessary for him to get workable yarn from almost everything given him, his troubles would be easily removed. And it should be ever remembered that there are many varieties of wool, which come to the carder hardly ever alike. Wool is affected by the locality of its growth, climate, health of the animal, and various other causes.

It is evident then that wool carders, as a class, must, as is the case with other people in this world, take with the good a very large share of what is not so desirable. In certain lines of manufacturing, the variety of stock is so great, and there is so much difference in the yarn to be produced, that

the chief requirement is to bring out a certain product at the least possible cost. Then the carder, who is always ready with acquired knowledge and ingenious expedients to overcome defects in the stock, as are likely to make poor work, is sure to be appreciated by his employer. G. B.

Ornamental Fabrics.

The design is usually first of all sketched on ordinary paper, the same size as it would appear when woven; one complete repeat of the design is then drawn upon point paper. As a rule, the pattern is brought out by a combination of warp and weft, but there are some textures figured chiefly by the weft, and others, such as Brussels and tapestry carpets, in which the pattern is entirely the product of the warp-yarns, the weft in the latter being solely for the purpose of interlacing the warp and for producing a firmly built and well-tied cloth.

In textiles, as in all forms of applied art, there is of necessity a close relation between the material, the structure of the fabric, and the ornament which decorates it. On the one hand, there is the great diversity of fiber used, while on the other hand we have the great variety of surface effects into which the fiber or fibers may be woven, and in order that the designer may give full value to his ornament when woven, these questions must of necessity be considered; for instance, there is a considerable difference between a woolen and a silk dress fabric, and it will be obvious that a design which might be perfectly satisfactory in the one might be quite out of place in the other, because of the difference of thickness in the fiber, producing a difference in surface texture that these fibers present when woven. The finer the fiber used, the finer and more flexible will be the yarn that can be spun from it. In practice, the thickness of the yarn which has been spun from the fiber and the number of threads which, in a given space, will appear on the surface of the fabric when woven, must have primary consideration, and this may be still further qualified by the fact that the yarn is not always used singly. In such a fabric, for instance, as a Brussells carpet, the yarn is frequently three-fold; that is to say, that three (or even more) separate yarns are folded together so as to make one fuller and thicker thread, this increased thickness giving added richness and softness of effect to the texture of the carpet and also giving greater wearing capacity and softness to the tread, though at the same time it imposes certain limits with regard to the choice of design.

There is one point of paramount importance which must always be borne in mind when designing for fabrics that have an open texture, or in which the threads are thick, to avoid curves that run for great lengths in the direction either of the warp or the weft, that is, vertically or horizontally; curves of such a character would lose all their value as curves, and would appear instead as disjointed straight lines placed in steps. The curves that are most typically satisfactory are those that run diagonally across the piece at, as near as possible, an angle of 45 degrees. Of course, it is obviously impossible to make all curves in that way; if they are made so, the design would be stupidly uninteresting and void of the necessary artistic qualities; but still this important fact must be recognized, and as many as possible should take a diagonal direction. Evenly rounded curves, such as circular ones, work very much in this way, but unfortunately they are not the most beautiful ones. It remains for the designer to decide between the choice of more or less curves, with their practical utility, and those of more variety and beauty; the choice must be ruled to a great extent, as before stated, by the coarseness or fineness of the material. In all coarse-textured fabrics it is better to let the lines of the pattern be simple and bold in character, aiming at the production of well-rounded and clearly-marked shapes. In fabrics of a finer character this difficulty to some extent ceases to exist.

In all carpet work the question of

color is of greater importance than the question of form. The nature of the fabric limits the designer from the point of view of securing refinement of ornament, but it affords exceptional opportunities for the display of rich combinations of color, and many designs which are exceedingly commonplace, as far as the pattern is concerned, are redeemed by the use of well-chosen colors.

Another large section of woven fabrics is that of Damask. A true damask is one in which the ground and pattern are worked out in sateen weaves, and the contrast which is necessary in order to bring out the effect of the pattern is obtained by making the long floats in the ground from the warp threads, and in the pattern from the weft threads, or vice versa. In this way the play of light upon the fabric defines the ground from the pattern, and according to the angle from which the fabric is seen, the pattern will be lustrous, or the ground will have the sateen-like effect. Damask, being a question of weave effect rather than of any particular fiber, may be produced in various materials, linen, silk and bright wools being those in which it is most effective. Damask weaving, as its name implies, originally came from Damascus, and was brought over to western Europe by the crusaders, along with the draw loom which was used in its manufacture. The true Damask has an 8-shaft sateen weave in both ground and figure, but in modern weaving, the term "damask" is used in a much more general sense, and is frequently meant to describe fabrics in which the ground only is sateen, while the pattern is brought out by some other weave effect—as a twill, for instance—which, by the comparative dullness that it may have, will contrast with the luster of the sateen ground. As a rule, the charm of a damask is retained most successfully by adopting a large and dignified class of ornament, rather than a light and dainty type of pattern, though much depends upon the particular use for which it may be intended; for some purposes the lighter class of ornament is more suitable, as, for instance, a linen damask table-cover, but in curtains and furniture fabrics the ornament would more appropriately be of a larger character. Some of the old Italian damasks are exceptionally good as models for the guidance of the student. In cases where the ground only is brought out with a sateen effect, and in which the pattern is dull by contrast, it is desirable to make the most of the rich lustrous sateen ground, so as to let it occupy the largest area, and the design should be arranged with this end in view. —[From Ornamental Design for Woven Fabrics.

Worsted Yarn.

(Continued from October.)

While it is desirable that all tops be of an even length, the best of them will vary considerably in the length of their fibers, and my idea in obtaining a level yarn is to work the average length, starting at the first part of the drawing, setting the rollers a little under the length of the longest fibers, and so gradually down to the roving. As to the drafts, it is common to put in about one more than the length of the ratch. This will do as a basis to work on for fine short wools, but for long wools this theory would not be practical.

Whilst admitting the above basis to be safe to work on, I, myself, would advise, in place of working the drafts according to the setting of the ratches, starting from the first part of the drawing, to commence from the roving. This would mean: shorter the ratches, larger the drafts. This may be contrary to many persons' ideas, but I believe it to be the correct way, for what will be lost in the breaking of the longer fibers will be more than offset by the gain in freedom from twits, for no yarn is enhanced in value by being twitty.

Be careful that the drawings are not too hard twisted. It is better that they be guided up to the reducers and roving, by feeling the slubbing, which should stretch easily. The twist can be altered by changing the wheel on

the twist pulley, also by the wheel on the lower back shaft. Examine often the drag of the slubbing and roving bobbins to see that it is not too great, so as to overstretch, as it were, the slubbing or roving, as it will make uneven yarn. This is a great evil and should be carefully watched.

If there are good conveniences for altering, a few trials at the commencement of a new lot would not be useless. No single should be permitted to go. The ends at back of the boxes must be kept up. If this is neglected, the waste account in the departments to follow will be increased. One of the chief considerations on the last operation in the drawing is the twist of the roving box: how many turns to put in will depend wholly on the quality of the stock. Rovings made to spin 70's will, on an average, require 4¼ to 4½ turns per inch. If we wish to spin 70's yarn in the spinning room, with a draft of 6¼, what should be the weight of the roving for each 40 yards?

Multiply the gauge point, 18.3 by the draft, and divide by the counts, as: $18.3 \times 6\frac{1}{4} \div 70 = 1.63$ drams, weight of the roving required. The standard weight for worsted yarn is a hank of 560 yards, of No. 1's yarn to a pound. Upon this basis all numbers run up, and to find the number of yards per pound, multiply 560 by any given yarn number. Thus, in 70's, it would be $560 \times 70 = 39{,}200$ yards. As 6¼ draft is going to be used in spinning, this would make 6,272 yards in roving equal one pound.

Gauge points are fixed numbers used for shortening calculations in finding the draft and twist of yarn. Without this gauge point, we would divide 560 yards in one hank, by the draft, as: $560 \div 6\frac{1}{4} = 89.6$ yards. Then, 256 drams in one pound divided by the counts, 70's $= 3.66$ drams. That is, 89.6 yards of roving weighs 3.66 drams. These, it will be seen, are awkward numbers. Taking 40 yards as the standard to work from, multiplied by the drams in one pound, 256, and divided by $560 = 18.3$, gauge point for 40 yards of roving. So it will be seen that in place of the double calculation, by using the gauge point, the system is more simple, and taken at once, as the one shown above.

Top rollers, both in the drawing and spinning rooms, should be kept in good condition. If carelessly covered, or the cement used be not of the proper consistency, the leathers will work loose, and the yarn from such will be thick and thin. When such yarns get into goods they cause imperfections. Have the traverses working the right distance, for if allowed to stand they will eventually wear a groove in the roller leather, and make uneven yarn. All working parts should be kept well oiled and free from waste.

The following is a draft for a cop spinning frame with the following dimensions:

Diameter of back roller ...1¼ inches
Diameter of front roller .....3 inches
Back roller wheel .....34 teeth
Inside studd do .....100 teeth
Outside studd do .....62 teeth

$$\frac{3 \times 100 \times 84}{1\frac{1}{4} \times 62.} = 325 \text{ gauge point for draft.}$$

As 6¼ of a draft is what we are going to put on for 70's, which divided into 325 will give change wheel required, as $325 \div 6\frac{1}{4} = 52$ C. W.

The following are the dimensions for twist:

Spindle whorl ..... 1 inch
Cylinder ..... 10 inch
Do pulley ..... 9 inch
Twist do ..... 18 inch
Cir. of front roller .....9 3-7 inch.
Front roller wheel ..... 180 teeth as,

$$\frac{10 \times 18 \times 180}{1 \times 9 \times 9\frac{3}{7}} = 380 \text{ G. P. for twist.}$$

Change wheel divided into 380 will give the turns per inch of yarn, or divided by the turns required to put into the yarn, will give change wheel.

It is customary for very fine yarns to weigh half a hank, by reeling from off 4 to 7 bobbins. The weight divided into 128 will give the counts, or vice versa. Another form of weighing is to take the same number of yards as the counts, as 36 yards of 36's, 70 yards of 70's, etc. The weight for this purpose is 12½ grains, called "count weight." Another example is to divide

1,000 as a constant number by the number of the yarn spun, and the quotient will be the weight of 80 yds. in Troy weight. Thus, 80 yards of 50's should weigh 20 grains, 80 yards of 70's, 14.28 grains, and so on.

Suppose it is required to know the amount of yarn, No. 70's that can be turned off per spindle, in a week of 60 hours, allowing 5 per cent. for doffing, waste, etc.

100 spindles × 37 revolutions of front roll ÷ 90 = 41 gross.

41 gross × 144 hanks in one gross = 5.904 hanks.

5.904 ÷ 70's counts = 84 1-3 lbs. turned off 100 spindles per week, or 13½ ozs. per spindle.

Space will not allow me to go further, but would like to add that in a majority of cases the object looked forward to is quantity, not quality. The young man must educate himself to get off good work; these rushing, spasmodic errors must cease. The demand is for a finer grade of yarn than hitherto, and no man can efficiently conduct a room on fine work unless he is fully qualified to make changes and handle his machines with mathematical accuracy. It behooves the young man who wishes to succeed to study and observe closely all that goes on around him, and grasp the theory as well as the practice. There is a wide field for development, and a man must not be afraid to plod on, overcoming obstacles, if he wishes to make himself proficient and attain success.

THE OLD MAN.

Textile Ornamentation.

FENWICK UMPLEBY.
Head Master Designing and Weaving Departments, Lowell Textile School.

CHAPTER III.

From the epoch that expired with the Roman Empire, to the period which commences with mediaeval times, there appeared to have been six or seven centuries of a weary and toilsome preparation, everything in a mixed and confused state. The world was, as it were, a vast chaos, and those forces which were destined to form a new civilization were at work in one confused mass, without any form or order. During the time of the Vandals, when they were masters of Africa, the Succi of Spain, the Ostrogoths of Italy, and even up to the time of Charles VIII, the people are considered to have lived in an age that was dark through ignorance, and barbarous through poverty and want of refinement.

Dr. Hallam, speaking of these dark times, says:—"At these times internal trade was hardly preferable to agriculture." There is scarcely a vestige to be discovered for several centuries of any considerable manufacture. Rich men kept domestic artisans among their servants, and kings in the ninth century had their cloths spun, woven and made by the women upon their farms, but the peasantry must have had their's supplied by purchase, therefore, we must conclude that each town or State had its manufacturer and weaver. During this period, Venice was at the head of commerce, and Amalfi held the second position. The trade in cloth appears to have been illicit, as we read in a passage in Luitprand's relation of his embassy from the Emperor Otha to Nicephorous Phocos, that the Greeks, making a display of their dress, he told them that "In Lombardy the common people wore as good clothes as they." "How," they said, "can you procure them?" "Through the Venetian and Amalfitan dealers," he replied, "who gain their subsistence by selling them to us." The foolish Greeks were very angry, and declared that any dealer presuming to export their fine cloths should be imprisoned and flogged. Schmidt tells us of a manufactory in the ninth century, of which he says, "cloths were manufactured and exported from Friesland to England, and other parts, in the same century." Gregory of Tours says: "Even in these unsettled times, the pilgrimages to the east redounded to the advancement of the industrious arts," and on the evidence of these devout pilgrims, returning from the Holy Land, he speaks of cotton, which

he describes as "a wool which is spun like that of sheep, and of which garments are manufactured." In another place, Gregory of Tours, seems quite delighted with the discovery of the cotton plant, which, he says, "is a tree, the fruit resembling small gourds, and is covered with a somewhat rough skin, that serves to protect the down contained in it: and, when I was at last enabled to see and handle it, it was not without admiring its extreme whiteness and delicacy." From these extracts we may be assured that artistic life was nearly extinguished for some nine centuries, and it would be a very difficult task to describe the condition to which the people were reduced, who formed an integral part of the Roman system, and fell with its destruction.

But, although the people were in a miserable state, we must not receive too literally the gloomy descriptions that Demegot, Pope Agatho, Gregory of Tours, and other contemporary writers have left us of that sad period, especially that which concerns the present subject. We will admit that the invasions of the barbarians, the political and religious troubles, had a great deal to do with the lack of energy in, and the decay of, the fine arts, but we must also admit that, with all these disturbances, artistic life was not entirely extinguished. The fine arts were cultivated, not only in Italy, but also in Gaul, even after the Franks had established themselves there, and whatever was the issue of battles, whether victory favored the Caesars or the barbarians, industry, in some form, must necessarily have been called into requisition, as is proved by the extract, from Gregory of Tours, when describing the re-discovery of the cotton plant. At a very remote epoch, we read of the Indians knowing how to manipulate this cotton, which they called Talla, and from which they produced the most varied articles. A Chinese writer who flourished in the sixth century, refers to the exquisite muslins, embroidered with gold and silver, which were manufactured in the principal cities of India, and his patriotic spirit takes fire at the sight of the noble daughters of the lettered class, preferring for a moment these foreign materials to the queenly and brilliant silken fabrics of his native land. Referring to Dr. Birdwood's work on Indian Arts, we read of many wonderful specimens of workmanship in cotton, linen and other raw materials.

In the time of Jedangir, Decca muslin could be manufactured so light and gauzy that a piece of fifteen yards long and one yard broad, weighed only nine hundred grains, the price of which was forty pounds. The three pieces presented to the Prince of Wales, which were made expressly for him, were twenty yards long and one broad, and weighed 1,680 grains, or three and a half ounces each. Favernier states that the ambassador of Thah Tafy (A. D. 1628-1651) on his return from India, presented his master with a cocoanut set with jewels, containing a turban thirty yards long, so exquisitely fine that it could scarcely be felt by the touch. In the handbook of the Kensington Museum, we read of muslin, which, when laid wet on the grass, became invisible, and because it became indistinguishable from the evening dew, it was named "subhnam," i. e. the dew of evening.

Terry, in his voyage to the East Indies, 1655, says: "The natives of this monarchy are the best apes for imitation in the world, so full of ingenuity that they make any new thing to pattern, howsoever hard it seems to be. It, therefore, is no marvel if the natives there make shoes, boots, cloths, and linen of our English fashion, which are all of them very much different from their fashion and habit." Terry also tells us "that they," likewise, "make excellent carpets of cotton-wool in fine mingled colors, so artificially mixed that they represent those flowers and figures made in them." Nearchus, producing proofs of their skill in works of art and imitation, says: "That when they saw sponges in use among the Macedonians, they imitated them by sewing hairs, thin threads and strings inextricably through flocks of wool, and after the wool was well felted together, drew out the hair, thread and strings, when a perfect sponge remained, which was dyed to imitate the original."

KNITTING DEPARTMENT.

The Knit Goods Situation.

The volume of business in knit goods is satisfactory; highly satisfactory, it might almost be said, but prices constitute another story. The meeting of manufacturers cannot be said to have accomplished as much good as was hoped for, although prices are somewhat higher all along the line, averaging about 10 per cent. on low grade goods, and running from 12 to 15 per cent. more on better qualities. It is amusing to watch the efforts made in certain quarters to depreciate the action of the National Association. It is true that supply and demand scarcely warrants much advance in quotations yet awhile, that nothing like an increase corresponding to the upward movement of raw materials, following tariff changes, has yet been obtained, and that any decision of the National Association does not find many mills outside of that organization. Still something is to be gained from action which is as near uniform as is possible, in view of existing conditions. The liberal buying and quick shipping requested, show again the depleted condition of stocks. The upward tendency of prices, as usual, has not deterred buyers, who like fish, bite best on a rising tide. It is the small trade that is doing most of the kicking over the stiffening figures. Such dealers as a rule do not keep well posted concerning the market, and when mark-ups are quoted, their chins drop and they write or call upon other jobbers and wholesalers, feeling that they can secure better terms. Just now, however, the tale is very much the same everywhere, and their search serves only to cover their chagrin. The heads of departments for the big retailers who at all times are obliged to keep a comprehensive view of the situation, have been realizing that tendencies are undeniably higher, and buy with a fair degree of freedom at the new prices, for their demands will not permit of delay. More than ever does the trade now realize that good goods have been made too cheap the last few seasons. Now that great lots of goods are going out at very narrow margins, the absence of reasonable profit is more felt than ever before. The finer grades of hosiery and underwear, such as lisles and fancies, have advanced disproportionately, but as the call for these has not shown much improvement, their figure in the result to the average dealer is not important. The same is true of heavy knitted goods. A mistake was made by allowing the associated press, in reporting the doings of the knit goods conference to quote the president in about this fashion: "By operating as a body the value of manufactured goods can be raised from 33 to 50 per cent. without materially affecting the retail price of the article." Two foolish errors are patent in considering that single statement.

There has been a slight increase in the cost of production since last season, in addition to the enhanced value of raw materials. The fall reorder business has been snipped short by the high temperatures thus far prevailing. As desirable goods were difficult to find, the weather bureau has saved merchants a lot of trouble. The uneveness in business among manufacturers for too or three seasons still prevails, and is sure to be a factor in the situation for months to come. Some knitters who have refused to talk higher prices until they were assured a respectable business on spring goods have recently been appeased with orders, and now view the prospect through the spectacles of the combine. On the opposite land so many factories have recently resumed work that other producers are still in the old box, which will operate as a weight on prices for some time to come. Traveling men, however, are jubilant, because trade taken alto-

gether is better than since 1892. The outlook is in one direction for better things. Specifically it may be said that goods containing Australian wools have shown the most advance, and large holders of that commodity must have turned a pretty penny. Plaids in hosiery are increasing, rather than decreasing in popularity, and the same tendency is shown in underwear by the growing frequency of fancy stripes. The call for plush lined underwear is a late development to be noted.

Knitting in the Fifties.

It is 308 years since the Rev. William Lee, the inventor of the knitting loom, or hand frame, was expelled from the Cambridge University, England, for marrying his wife, contrary to the statutes of those times. Having no fortune, his wife was obliged to assist towards getting their support, and she did such by hand knitting. Her husband watching the movements of the needles with her fingers, conceived the idea of his hand knitting machine. Knitting by hand was first practised in Scotland; the first hand frame was invented by Mr. Lee, in England, and the first power knitting frame, was invented by Egberts and Bailey, in this country.

These inventions revolutionized the whole system of knitting, and to-day nearly all styles of clothing, hosiery, leggings, underwear, mittens, caps, shawls, coats, vests, pants, etc., are manufactured on the power frame. To show what has been accomplished, to a great extent, by American ingenuity in the past fifty years, illustration, Fig. 1, is referred to for an idea of the first upright rotary knitting frame for underwear.

The inventor of this frame was Clark Tompkins, Troy, N. Y. The invention appeared for the first time in 1854. I was then working for Thos. Fowler, when Mr. Thompkins would come to Cohoes every few days, from his works in Troy, which was established in 1846, as a machine-shop, and study and shaft his machine.

The Fowler mill, which was the original knitting mill where power was first applied to the Egberts and Bailey frames and Tompkins upright rotary, was built in 1831; but was torn down this summer, after standing 66 years, by the proprietors of the Parsons Manufacturing Co., who purchased the old plant.

Bailey secured a patent for his frame, February, 1852, and Tompkins not until September 18, 1855, but the principle of operation was altogether different. For a number of years many of the Bailey frames were in use, but they have become obsolete, while the Tompkins' has increased. A

CLARK TOMPKINS.

picture of the modern machine is shown in Fig. 2.

Returning to Fowler and Tompkins: Fowler employed Tompkins for a time, planning and perfecting a machine for him, for which he secured a patent, July 3, 1855, but some differences occurred between these men, and how they were settled, I never learned. Inside of three months, however, Tompkins, and one Johnson, secured a patent, and another, May 27, 1856. Clark Tompkins died in California, 1876, when his sons succeeded him in business.

It is, perhaps, needless for me to say, that, while makers of knitting machines have accomplished much, of late, toward improving and bringing out new ideas, with good results, there

is still much to follow, for of late I have seen some knit underwear, not yet given to the trade, which will be greatly appreciated by the consumer. It is made on the upright rotary, spring-needle machine, and by the ingenuity of our American inventors of automatic machinery, which, a few

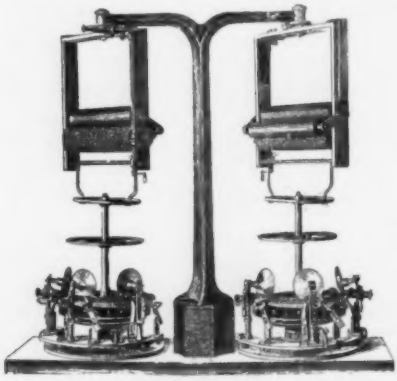


FIG. 1.

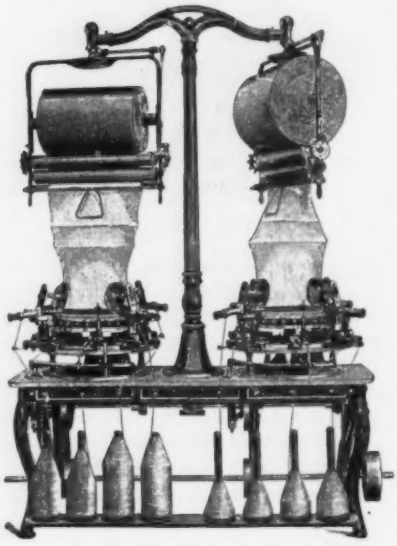


FIG. 2.

years ago seemed impossible. Difficulties are being overcome, and the workmanship on knitting machines is better than formerly, as finer and better goods are called for. This necessitates greater accuracy, and nicer mechanical adjustments, and is not confined to the automatic latch needle machine, solely, as the spring-bearded needle machines contribute their share of efficiency, due to the skill of the inventor. Machines that a few years ago were operated at a speed of 40 revolutions, were supposed to have reached the extreme limit, and most all were operated at 32 to 36. I saw in a mill in Cohoes, a short time ago, machines running over 60 revolutions, making the best of work on 18 and 20 gauge, demonstrating the accuracy of workmanship. A SCOTLAND.

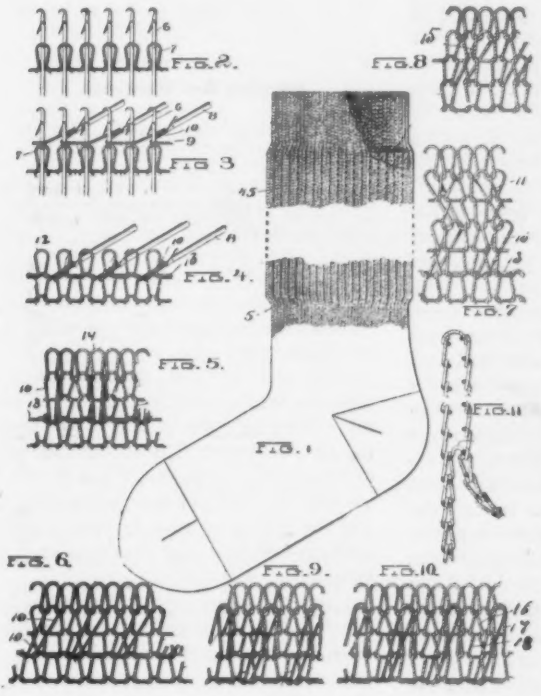
A New Method of Knitting.

A recent invention has appeared for the fabrication of knit goods; but it relates more particularly to stockings of the class which have ribbed leg portions, and plain ankle and foot portions. It is intended to obviate certain defects which have been present heretofore in some cases, to simplify the process of manufacture, and to cheapen the cost of production. Usually in the production of stockings having ribbed leg, and plain ankle and foot, the different portions are knit on different machines. This necessitates a transfer of the portion which first is knit to a second machine and also the application of such portion to the needles of this second machine.

In order that the disadvantages that may arise from methods that are now more or less in vogue, may be obviated, the machine or invention in question is intended to knit a stocking of the class mentioned on a single machine, beginning at the toe and ending with the top of the leg, of one or more yarns or threads which shall be continuous from the beginning of the stocking to its end. A welt or hem is formed on the machine and subsequently finished off in a simple and expeditious manner. The invention also consists in an improved stocking of the ribbed class, characterized by being knit, beginning at the toe, of a continuous yarn and with unbroken and continuous courses of loops at, and adjacent to, the place where the change is made from plain goods to ribbed goods, with closed or reduced eyelet-holes at the junction of the

plain goods and ribbed goods, and with a secure top finish in the form of a knit welt or hem.

The accompanying illustrations show, in Figure 1, a view of a stocking embodying the invention, a portion of the length being broken out to save space. Figs. 2 to 5 are views illustrating successive steps taken in changing from plain knitting to rib-knitting. Figs. 6 to 10 are views showing features that are readily understood. Fig. 11 is a view showing in a greatly-enlarged scale the features of the hem that is formed at the top of the stocking-leg.



In carrying out the purpose of the invention, begin at the toe and successively knit in usual manner the toe, foot, heel, and ankle in plain stitch on the plain needles of a knitting-machine capable of rib-knitting and also of performing heel and toe work upon these needles. The knitting is continued in plain stitch above the heel until an ankle portion of sufficient length is produced. From this point up the leg of the stocking is knit in rib-stitch. On arriving at the point 5, suspend or stop the knitting action of the needles, 6 (see Figs. 2 and 3), which are in engagement with the last-formed loops or stitches, 7, of the plain fabric and which are termed "plain" needles. Fig. 2 shows a portion of the fabric and a few of the plain needles as the fabric and needles appear at this time, Simultaneously with such suspension or stoppage, or immediately thereafter, other needles, 8, to come into action, alternating in the desired order with the plain needles and termed "ribbing-needles."

The machine is operated sufficiently to lay the yarn into the hooks of all the ribbing-needles and then retract these needles so as to draw the yarn in what, for convenience, is termed a "welting" course, 9, around the plain needles, which, it will be remembered, are not knitting at this time. This operation merely places loops, 10, on the ribbing-needles, 8, and adds the intermediate portions, 13, of the yarn of which such loops or stitches are formed to the loops or stitches which were last formed on the plain needles, 6, as shown in Fig. 3.

The ribbing-needles, 8, are now inoperative for knitting and render the plain needles, 6, operative again for knitting, knitting one or more courses on the plain needles. The ribbing-needles, 8, are then thrown into action for rib-knitting.

The first regular loops of the ribs are shown at 14 in Fig. 5. The appearance of the fabric will then be substantially as shown on an enlarged scale in Fig. 5. If desired, more than one welting course may be laid around

the needles before the ribbing-needles are thrown into regular action. In the foregoing case the ribbing-needles are not shogged laterally during the short interval while they are rendered inoperative and while they are in their retracted position holding loops, as in Fig. 4. Preferably, however, the said ribbing-needles are thus shogged during the short interval, so that when rib-knitting is begun they will work through spaces between the plain needles, which are one removed to the one side or the other of the spaces through which they were projected to seize the yarn, thereby making a course of shogged loops, 10, as in Fig. 6. The result in the case of shogging the ribbing-needles to the extent of one space and then bringing them into action again is as shown in Fig. 6.

In Fig. 9 is shown a mode of obviating the formation of eyelet-holes. Thus, proceed through the stages which are illustrated in Figs. 2, 3, and 4. Having rendered the ribbing-needles inoperative, they holding loops, 10, as in Fig. 4, and having rendered the plain needles, 6, operative and knit thereon the course of loops 12 (shown in Fig. 4). The plain needles are inoperative again, having meanwhile shogged the ribbing-needles to the extent of one space. Then a second welting course is laid upon the needles, the plain needles remaining inoperative and the ribbing-needles being worked sufficiently to draw loops of the second welting course while retaining the loops, 10, already held by them. The ribbing-needles then are rendered inoperative and the plain needles operative, courses 18 and 16, being knit on the plain needles. The ribbing-needles are then thrown into action conjointly with the plain needles. This, the inventor believes, will yield good results. Fig. 10 differs from Fig. 9 only in that the second welting course of Fig. 9 is omitted, the ribbing-needles, after having been shogged, being caused to engage with the connecting portions of the course of yarn from which the loops, 18, are formed and to retain the loops, 10, etc., while the plain needles proceed with the formation of the courses, 16, the rib-needles thereafter being thrown into action simultaneously with the plain needles, so as to produce ribbed fabric, the first course of the latter being represented at the top of Fig. 10.

Important characteristics of the stocking are that the courses of loop progress or are developed from the toe to the top, and that the plain seamless foot and ribbed leg are both formed of continuous yarn, and hence the courses of loops are unbroken or uninterrupted at the place where the change from plain goods to ribbed goods is made.

Parallel Bed Machines.

ITS INVENTION AND DEVELOPMENT—LAMB TYPE OF KNITTING MACHINE

The matter contained in this article is taken from an essay by the late James Foster, of Preston, England, and first appeared in type in the Knitters' Circular.

It is recorded that one of the greatest difficulties that had to be contended with in the Lamb type of knitting machines, was the absence of any method for holding the needles in position whilst casting on, or when there was no yarn in the hook. Owing to this defect, if a stitch dropped, or the yarn broke, the freed needles all slid down out of working position, and for a time no remedy was discovered (nor is their any provision in his patent).

As an inducement to the workmen, a reward was offered to any person who would suggest a remedy.

One day, as one of the men were returning from dinner, rain commenced; he shot up the umbrella he was carrying and it remained up, because it was held up by the spring stop, which suggested a similar arrangement for the needle, for which suggestion he received the promised reward.

The first American patent is dated September 15, 1863.

The machine as it was first patented, was not a mechanical success, and it was on this account that Mr. Lamb continued to work at the machine until it was brought into the shape in which it was put on the market.

He had in the meantime paid off Mr. Hales.

One working machine was produced by the end of 1863, and one hundred machines of the family size, eight inches wide, and six and seven needles per inch, were built for Mr. Lamb by Messrs, Sessions, Arey & Co., of Springfield, Mass. A Mr. Alvah Strong finding the money, these were readily sold and a good demand was the immediate result.

The Lamb Knitting Machine Manufacturing Company was organized at Rochester. Mr. Lamb and Mr. Strong received $10,000 for one third of their interest in the patent.

Mr. Hales organized a company at Springfield, Mass., called "The Lamb Knitting Machine Company."

The Rochester company got out eight hundred machines in 1865.

In the winter of 1866 Mr. Lamb paid a visit to England, his invention being patented in that country on the 26th of May, 1865, sealed on the 22nd of September, No. 1445. His time was occupied in Leicester by having a few large machines built for cardigan work; beyond this Mr. Lamb made no progress in England. He went over to the Continent during this visit and made arrangements to carry on business in France and Belgium, and attended the Paris Exhibition, at which a machine was left, being the first sent to Europe. He returned home in April, 1867.

During Mr. Lamb's visit to Europe, the two companies amalgamated and bought the plant of the Massachusetts Arms Company, at Chicopee Falls, where the business has been continued up to the present time.

The claims in the English patent were for a knitting machine, with two straight parallel rows of needles, by which tubular work is produced, with facilities of widening and narrowing the work, to change from a large hose to a small one on the same machine, and in knitting the heel, and making various styles of ornamental and ribbed work in a flat piece.

There were also minor claims for the construction of the jacks, sliding carriage, yarn carriers, latch openers, setting up the heel, etc.

Sometime in 1864 or 1865, whilst walking along a lane in the country eating my lunch, I (James Foster) looked over the paper in which the lunch had been wrapped and noticed a paragraph, which announced that a man in Rochester, U. S. A., had invented a knitting machine. At this time I was interested in the sewing machine, and had business with many hand knitters to whom I sold yarn, so decided to write and see if there was anything in the invention. I addressed my letter to the inventor of the stocking knitting machine and received a reply which stated that the writer, J. W. Lamb, was a Baptist minister, and that his intention was to sell the patent rights to a company who would build the machines and arrange business matters. He further stated that when the company was formed, he would lay my letter before them, when my application would no doubt receive due consideration. I heard nothing until the Autumn of 1867, after the amalgamation and location of the firm at Chicopee Falls, when they wrote offering me the European agency and requesting me to forward £100 for ten machines.

I replied that I was not prepared to undertake so great a responsibility, but if they appointed a general agent for Great Britain, I would undertake a sub-agency for the North of England.

In January, 1868, Mr. Kennedy of Edinburgh, called upon me at the request of the Lamb Knitting Machine Company, to inform me that he had just returned from America, and that he had been appointed general agent, and was prepared to give me the agency for the North of England, and send up from Liverpool one of the machines he had brought over. I thus received the first Lamb machine delivered in this country, and gave a fortnight to study its workings and make the first scale. Mr. Kennedy could not work it at this time, nor was

there any instruction beyond a couple of general but vague directions for making a stocking.

Mr. Biernatzki, of Hamburg, made an arrangement for a German agency about the same time, and received his first consignment December, 1867, or January, 1868.

At this time there was no provision for making a closed heel. I had no difficulty in disposing of the stockings in the district around Preston, and to the country people visiting Preston, to whom the new knit stocking soon became a substitute for their hand knit.

During the end of 1868 or beginning of 1869, a Mr. Paterson, of Monkweanmouth, commenced to knit and sell hose, and successfully introduced it into that district, but the rough and unsightly stockings prevented the machines from making headway.

Mr. Biernatzki wrote to me describing his experiences in Germany. In March, of 1868, he sent the first machine he received to Breslau, with a small sample stocking about 2¾ in. long, and having about 270 loops. No one could knit a stocking on the machine; they could only cast on and knit a length of circular fabric.

One morning, the Agent at Breslau was astonished to read in the newspaper that there was a wonderful knitting machine that would make a great change in the family knitting of the future, for thirty-six pairs of stockings could be knit per day.

This unexpected advertisement had been inserted on the report of a person who had noticed how many courses per minute could be knit, and had calculated the number required for a stocking, and therefore the number of stockings per day, without reckoning the time required for the heel and shaping.

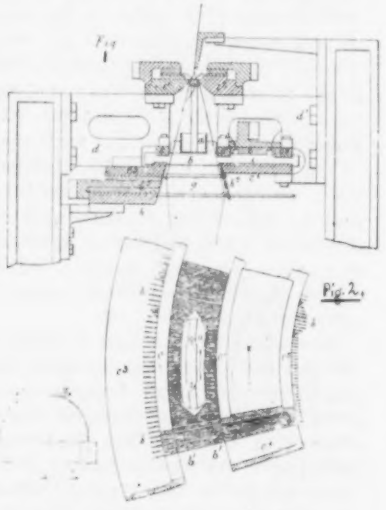
This deceptive announcement produced a great impression throughout Europe, and letters came from all parts to the Breslau agent desiring to be informed about this machine. In the end, all letters were sent to Mr. Biernatzki.

The curiosity awakened by this announcement, produced a great difficulty. At Mr. Biernatzki's no one could produce a stocking, and therefore they could not answer many of the questions. About twenty-four machines were ordered as samples. Following the delivery of these were numerous complaints and returns; some of the returns were broken through bad packing.

The faulty and unsaleable stocking produced with the open heel, the narrowing down the side, and the mock welt top were barriers to success, which we had all to contend with up to 1869. None of us had sold many machines up to this date; I had a few planted here and there in Lancashire.

Circular Loom.

There has quite recently been invented a circular loom, by a resident of Nottingham, England, in which the warp is so disposed as to form a circular shed in which the shuttle travels, and



has a constant motion in a circuit, or path. In order that our readers may more clearly comprehend this invention, we present illustrations of it. Figure 1 is a sectional elevation showing a part of the machine; Figure 2 is a plan of the shuttle and operating mechanism; Figure 3 is a side elevation of one of the shuttles; Figure 4 is a sectional elevation, on a larger scale,

of a portion seen in Figure 1; and Figure 5 shows the beating-up mechanism. One or more shuttles may be employed, though in the drawings, herewith given, only one is represented. The shuttles are carried and operated by radial jacks or slides "b," which are carried by outer and inner rings "c, c^1, c^2, c^3, c^4," provided with radial recesses or gates to receive the jacks "b," and in which they freely slide. The rings are carried by brackets "d d^1," secured to vertical supports. Each shuttle is formed with a curve corresponding to the curve of the race in which it travels, and is provided at the rear with two oppo-

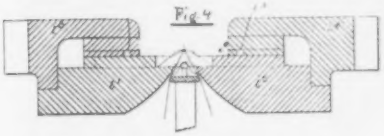


Fig 4

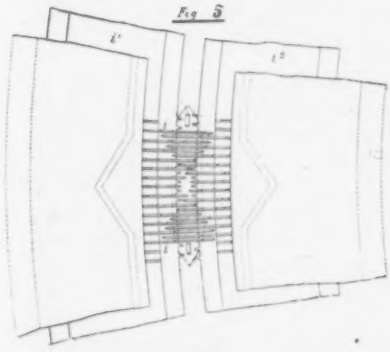


Fig 5

sitely inclined surfaces. It is propelled by the action of the jacks "b," which are operated so that their extensions "b'" successively approach from both sides, the centre line of the shuttle race. The shedding motion is effected by radial guides "g," arranged in two tiers and carried in radial recesses or gates on the under side of the ring "c" and the upper surface of the ring "h." The inner ends of the guides "g" are also supported by the slay-ring "h^2," secured to the guide-ring "c^4." The beating-up is effected by slides "i," shaped as seen in Figures 4 and 5, carried in upper and inner rings, "i^1, i^2," secured to brackets and provided with radial recesses or gates to receive the slides. The slides "i" are actuated by outer and inner cam-rings "i^3 i^4," provided with cam grooves. We will omit any further description of this machine, presuming upon the practical knowledge of our readers to appreciate the operations of its principal parts.

Apparatus for Making Artificial Silk.

We hear but little of the recent efforts to establish factories in this country for the making of artificial silk according to the patented processes that were first introduced in France. Much was anticipated from the movement that was made last spring to erect factories to manufacture the imported artificial silk yarn. As nothing has yet been done in this respect, so far as we can learn, we are somewhat inclined to think that the scheme has not been considered a feasible one; still, we notice in our foreign exchanges that the manufacture of artificial silk is still receiving the attention of the inventors, who are very busy trying to perfect an apparatus for the manufacture of the thread. One of the difficulties, it is reported, attending the manufacture of the thread is that of piecing up the various threads that are to be twisted together to form one of a proper count. We notice, two illustrations of apparatuses designed to overcome this difficulty. Both of these machines are similar in character, the difference being that the solution to form the artificial thread in one machine is forced through the orifices by means of plungers, while in the other machine the solution is contained in a vessel, or cistern, arranged at some distance above the orifices, and, therefore, in a position to exercise the required pressure without the use of plungers.

—Never put upon the cards what the picking should do, or expect the railway heads to do what the cards ought to do, or the drawing and roving frames to even up what the railway heads are made for.

POWER DEPARTMENT

O. R. YOUNG, M. E., Editor.

The Development of the Steam Engine for Textile Purposes.

ALFRED SAXON.

Abstract of a paper read at a meeting of the Manchester (England) Association of Junior Engineers.

While the principle of the steam engine remains much the same as when first introduced by Watt, the development of some of its chief properties has been carried out to a remarkable extent. This development has been chiefly in the direction of increased speeds and pressures, advantage being taken of more fully utilizing the expansive properties of steam through additional cylinders, according to the boiler pressure available.

Great improvements have been made during this period in the manufacture of the steam engine by the use of better and more accurate machine tools, dispensing as far as possible with hand labor, excepting in the fitting and adjusting of the various machined parts to each other. We have also had a greater choice of materials available.

A more scientific knowledge of the principles of the steam engine has been acquired; reliable data have been established; and the mechanical draughtsman designs the various parts with the knowledge of the stresses and strains to which they will be subjected. The old engineers very often had either rule-of-thumb ideas on the subject, or depended very largely upon their judgment and practical experience in determining the strengths necessary.

Along with improvements in steam engines, there has been a corresponding improvement in the construction and manufacture of boilers and appliances for generating steam.

Speaking generally, up to 1870 may be taken as the single-cylinder condensing period. The types chiefly in use about the year 1870 were (a) the beam engine, made to work singly or in pairs, both single condensing and compound; (b) inverted or overhead verticals; and (c) some specimens of the marine type. Most of these were governed by a throttle valve, automatic expansion governing being then in its infancy.

The horizontal type, such as is found in general use in the neighboring mills, was then only gradually forcing itself into use, and most of the engines of this early date were described as of a given nominal horse power. This term after a time became very misleading, and has now almost died a natural death, the term "indicated" horse power being now generally applied.

The greatest barrier for a time to the development of the steam engine in the direction of using higher pressures was the difficulty experienced in producing boilers of a large size to safely carry the required working pressures, those made up to 1870 being constructed to carry a pressure not exceeding 75 pounds. The fact was well known that with a comparatively small increase in heat, considerable increase in pressure was obtained.

The period from 1870, to, say, 1890, may be taken as the compound period. From the time of the very first practical steam engine made, all the important improvements devised had resulted in reduced initial condensation in the cylinders, and it was this that largely effected the saving and made the engine more economical.

In single-cylinder against compound engines it was found in some cases the best single type compared favorably with the average compound up to a certain pressure. The compound, however, in its best form was undoubtedly superior. The same may be said of the compound and the triple.

There are some compound engines working as economically as some of the triple, but I do not think that the best compound engines will compare with the best triple. The reason that a great increase of economy is realized with triple and quadruple expansion engines in working at high pressure is because they are working under conditions more nearly approaching those required for their maximum efficiency. This may principally be accounted for by the circumstance that the range of temperature through which the steam passes in any one cylinder in the course of a revolution is less, and the wasteful condensation consequently reduced.

I may say that in marine practice the use of triple and quadruple-expansion engines has been until recently in advance of land practice. The absolute necessity of economy in steamships which have to make long voyages, and the fact that the saving of every ton of coal means a ton of freight earned, has done much to accomplish these changes. As a proof that in land practice the development in triple and quadruple is comparatively recent, all present will probably remember that the Jubilee Exhibition held in Manchester in 1887 had no engines of this kind—certainly none of a large size—exhibited there.

Triple-expansion engines are being constructed both of the horizontal and vertical types, and a number of compound engines have been altered to work on this principle at boiler pressures varying from 100 to 200 pounds. The results achieved by the new triple-expansion engines, and those also which have been converted from compound into triple-expansion, vary very much. The coal consumption, however, is a very unreliable test, the quality of the coal and the cost varying so much.

The weight of steam used by the engine per indicated horse power is the best test. The economy of a steam engine is, therefore, to be measured inversely by the weight of steam per indicated horse power per hour, the most economical engine being the one which requires the least weight of steam for the given power. Watt in working with low pressure steam had at his disposal the most prolific portion of the efficiency curve, and as we gradually raise the pressure, the rate of efficiency becomes less and less until at about 500 pounds the curve becomes very flat, and a time must come when it will not pay to increase the pressure further.

A further advance has been made in introducing the quadruple-expansion type of engine. Along with the improvements in the construction and manufacture of the steam engine, the methods of testing the economy of steam engines and boilers are also worthy of notice.

So accurate and scientific are these tests as carried out by experts to-day, that the steam can be put in the scales, so to speak, and measured and weighed, and it is now almost universally acknowledged that the best method of testing the economy of a steam engine is to measure the weight of steam used per indicated horse power, rather than the old method of weighing the coal, without dealing with the steam or water consumption.

The advantage of this course is that the efficiency of the plant for generating the steam is determined, as well as that of the engine using the steam.

Losses in the steam engine from condensation and other causes are still no doubt considerable, but these have been combated to a certain extent by reducing the range of temperature in the cylinders, and also by steam-jacketing the cylinders and efficiently covering the exposed parts of the cylinder by suitable non-conducting material.

Another method adopted is the arrangement for superheating the steam so that it may be admitted into the cylinders as dry as possible.

There have been, besides, many minor improvements, such as the introduction of Corliss valves and other expansion valve gears, adjustable pedestals, adjustable piston packing, indicating gear and indicators, sight-feed

lubricators, rotary oil pumps for continuously lubricating main bearings, radial lubricators for crankpins, the adoption of electrical and mechanical stop motions (so that in the case of a breakdown the engine may be brought to a standstill), metallic packing for piston rods and valve spindles, steam barring engines for automatically barring the large engines round. I might refer to many more interesting improvements, but I will content myself with saying that the progress in the steam engine during the latter portion of this century in these respects has been very great.

When we consider that 8 or 9 pounds of coal per indicated horse power was commonly used in the earlier form of steam engine, and that there are engines to-day which are only burning 1½ to 1¾ pounds of coal per indicated horse power per hour, it will be seen by all that we have approached considerably nearer the goal of theoretical efficiency than any of the old engineers would have thought at all possible of achievement.

Quality Should Tell.

Editor Textile World:

I was much impressed with reading in the Textile World for October, "Ike Cann's article on American vs. Foreign Machinery. During the past three or four years it has seemed to me that the man who quotes the lowest price has scooped the order. Quality does not seem to count, and there are hundreds of like cases. The machine builder who puts good iron and good honest work in his machine, can't compete with the fellow who simply builds stuff, regardless of quality. Good work costs money, and it is strange that a manufacturer will give the preference to a cheap machine because it is low in price, when his common sense ought to teach him that any reputable concern, that has regard for reputation will do his work at as low price as he can afford. A few years ago I put a machine in a mill, in the same room with another machine. I remarked to the master mechanic that his seemed unnecessarily heavy. His reply was that they tried to get strength from quantity, instead of quality. Poor cheap iron and lots of it. He also said, "If a part broke he had to handle it carefully or he would break it more in repairing it; while if a part of our machine broke he could hammer away at it with no fear of breakage."

It is hopeful that, with the revival of trade and a show of some profit, good, honest work will receive more consideration than cheap work. It is more satisfactory and certainly more economical to use a first-class machine of any kind, one that is not going to want repairs before it is fairly started, than to use one that is a constant source of annoyance. CRANK.

Foundations for Heavy Machinery and Other Structure.—I.

FRANCIS H. BOYER.

It is the province of but few men to be called upon to plan and erect foundations for heavy structures, and a glance at the work of a few of the noted ones will give an idea of the skill necessary in building structures.

John Fitz, of the Bethelehem, Pa., Iron Works, in his talk before the winter meeting of the American Society of Mechanical Engineers, 1896, in response to a paper read by C. E. Billings, president of the Billings & Spencer Co., of Hartford, Conn., and at that time president of the society, gave an interesting description of the foundation for the hammer at his works, which is the largest steam hammer in existence.

The hammer which gave trouble, says Mr. Fitz, weighed 125 tons.

First we prepared the foundation about 60 feet square, and drove it with piles until we could not drive them another inch or get another in. These piles were covered with timbers 34 inches square, on top of which were put forged beams about 35 feet long—each of these beams weighed some 40 tons—the object being to catch the timbers so as to get the surface.

Next we crossed timbers on top, and

put on an anvil block which weighed about 1500 tons. (see sketch No. 1.)

The hammer was run but a short time when the foundation went down 8 or 10 inches, and unfortunately it did not go level, which made it worse.

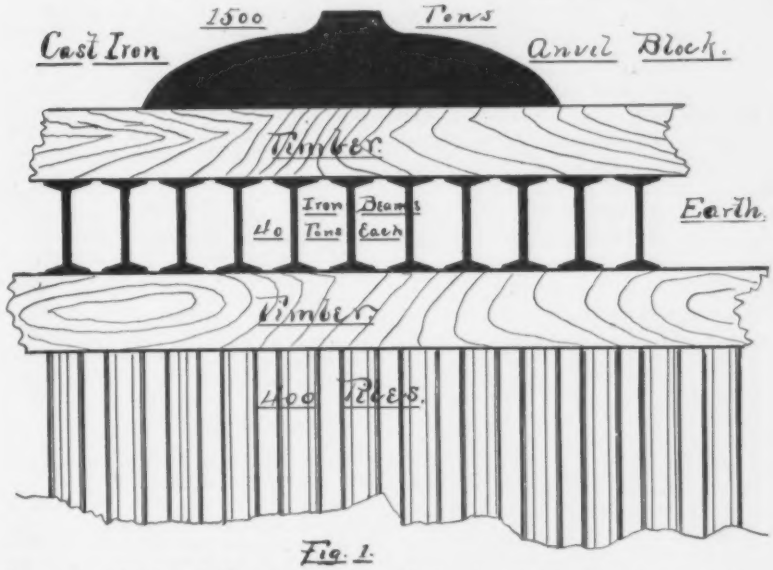


Fig. 1.

This was covered to a depth of two feet with wood shavings, obtained from car shops. These were trample down to about sixteen or eighteen inches thick, and heavy timbers were placed on top. The forged steel

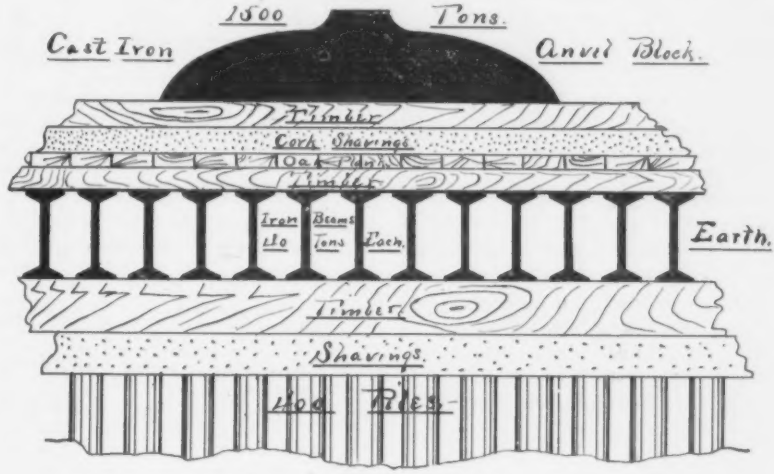


Fig. 2.

There came a dilemma. What to do, was the question; and the whole thing was taken out, down to the piles, and the foundation levelled up again. beams were next put on, crosswise, and on top of the beams were placed ten inch square timbers, and about 1500 weight of cast iron. This casting

was covered with three inch plank, and then twelve inches of cork.

On top the cork ten inches of timber was placed and then the anvil block. (See sketch No. 2.) The hammer has simply worked magnificently ever since.

In reply to a question as to the results, Mr. Fitz said, "We had to save the foundation, and not the hammer. If we had put the anvil on the foundation again it would have gone down; the shavings took the strain of the blow. The hammer has been running for four or five years, and has remained in its first position.

"The idea of using shavings was not original. It came from the old practice of placing brush under heavy steam hammer forges to produce elasticity. We did not need the elasticity for the hammer but to save the foundations."

In Mr. Fritz's description, he says that the piling was drove close together: experience has taught that, for heavy driving, piles driven 36 inches from centers is as close as they will stand (this will be treated in another article.

By placing the piles 36 in. from centers, we have 400 piles driven in this foundation whose combined maximum resisting strength would be 44,800 tons. It is not stated how many piles settled in the foundation mentioned by Mr. Fritz, but by applying the rule of 112 tons for the maximum strain of each pile, this multiplied by the number of piles which settled, would give approximately the force of the blow exerted on the hammer, and it may be safe to say that there was a blow which equalled from 10,000 to 15,000 tons resistance.

Chalk Talks.

SETTING HORIZONTAL TUBULAR BOILERS.

The size of the boiler taken for example is 60 inches in diameter and 16 feet long.

The depth of the foundations will depend upon the condition of the soil; if hard and firm, three feet of masonry set in cement will be ample, this rising to within four inches of the level of the bottom of ash pit, which may be laid with hard brick on edge, or cemented.

By referring to the diagram, it will be seen that the walls are double, with a two-inch air space between them; the outer wall is 12 inches in thickness all around, the inner side walls being 16 inches thick at top and bottom, conforming to the shape of the furnace, and lined with fire brick above the grates.

The section through furnace shows that the fire brick lining has two sets of headers, one at the height of the bridge wall, and the other at about the same distance from the grates above it; thus making it possible to remove comparatively small sections of the lining for the purpose of making repairs.

The inner rear wall would be 12 inches in thickness, and located 24 inches from rear end of boiler.

Headers are placed at frequent intervals in the two-inch air spaces, adjacent too, but not touching, the inner wall.

Expansion is provided for by rolls being placed under the lugs at back end of boiler. This end should be set one inch lower than the front, and the grates pitched three inches lower toward the bridge wall, which is covered, top and front sides, with fire brick.

A brick paving covers the bottom of the combustion chamber, sloping from the top of the bridge wall to the level of the rear cleaning door.

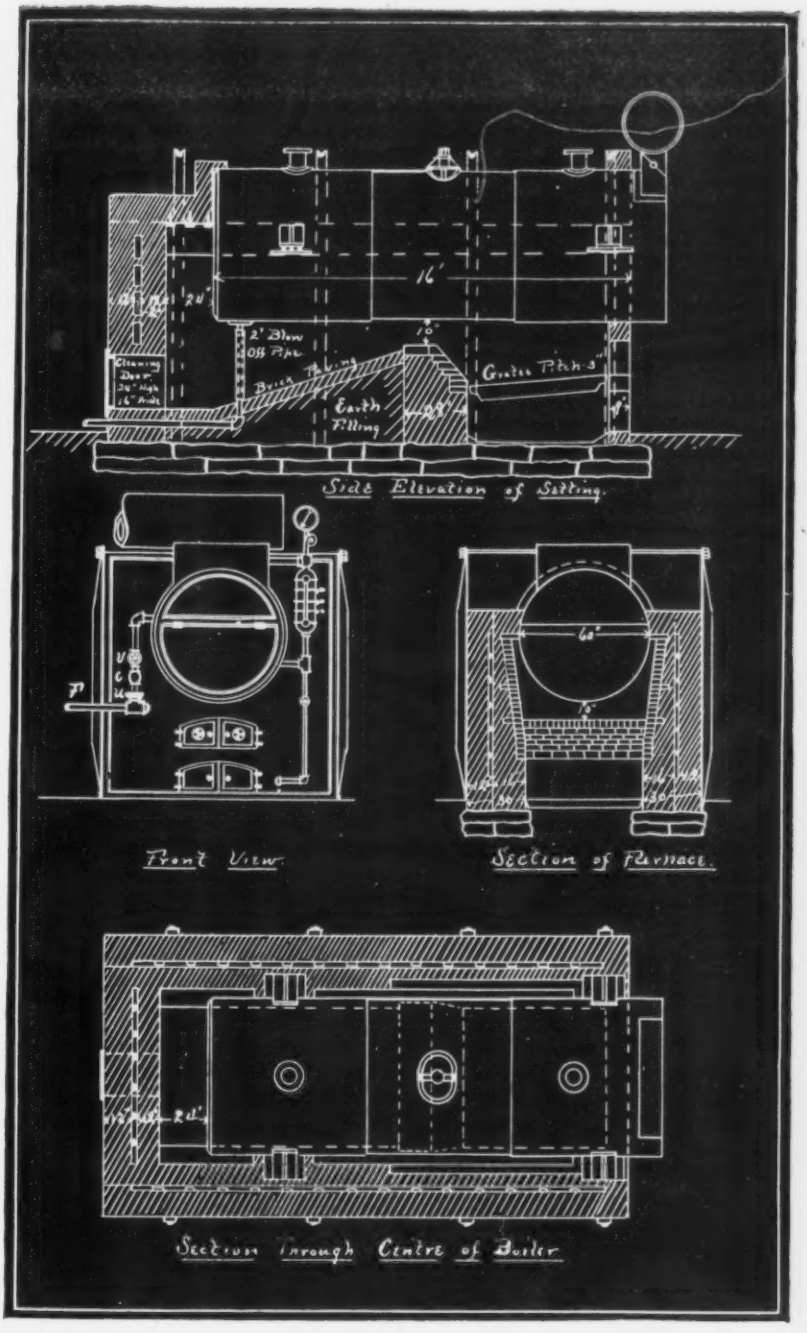
The feed pipe enters on the left side just above the tubes, extending nearly the entire length of the boiler.

A stop valve, check valve, and union or flange, are placed on the feed pipe in the order named, the stop valve being nearest the boiler, to allow of repairs being made while under pressure.

The steam supply main should be piped from the rear nozzle, and the safety valve placed on the front nozzle, as the circulation is more rapid in the front part of the boiler, and in case of an emergency the safety valve would be most efficient on that part of the boiler where steam was being made most rapidly.

Feed pipe, fittings and water column fittings should preferably be of brass, to resist corrosion by action of the water. There should also be a connection from the feed pipe, so that the boiler can be fed through the blow-off, for temporary use in case of emergency.

The next Chalk Talk will be devoted to setting a battery of two, or more, horizontal boilers, the subject being taken up more in detail.



SETTING HORIZONTAL TUBULAR BOILERS.

When Engineers are Engineers.

What a gloriously happy condition will be experienced by us all, if the time ever comes when engineers all become engineers.

Making this remark to a brother engineer recently, he replied, "that time will never come," yet the writer feels it will, or at least be very nearly approached.

The above came very forcibly to the writer's mind on going to the engine room one morning to relieve the night engineer (2nd assistant). (Our plant consisted of 4 tanden compound condensing engines aggregating 1200 h. p., using independent condensers.)

Orders had been left the night before to have engines numbers 2 and 3 running, but number 2 was found not running and on inquiring of the 2nd assistant why, he stated that "there was something the matter with it, he didn't know what." He had "tried to start it up but it wouldn't go." Telling him we would look it over, we let him go home in "blissful ignorance."

Going down to the room we found engine No. 2 and vicinity covered with spots and spatters of what appeared to be whitewash or something similar. Examination showed that the low pressure cylinder was broken in two, about two inches back of the flange on the crank end, the piston broken, the rod bent, and minor disasters "too numerous to mention." The cylinder was found to contain a quantity of sand and some particles of sea weed, (we use salt water for condensing).

Later investigations proved when the 2nd assistant got ready to stop the engine at midnight, he closed the throttle and immediately stopped the air pump condenser. The result was, that the low pressure cylinder became precisely similar to the water end of a large steam pump.

The engine must have been running at quite a high speed, and continued running after the air pump stopped. And that "happy go lucky" 2nd assistant had not found out that he had done any damage, though he was highly recommended to us and held a license.

It only cost about twelve hundred dollars to repair damages to the engine, together with about three weeks lack of service, but it took much longer than that to calm the ruffled temper of the writer, and he has not yet ceased to say "if engineers were only engineers."

Talk about the Massachusetts license law being too severe. Indeed it is not, and it is to be hoped that examinations may be more thorough.

The influence of the engineers associations is being felt and must continue along that line till the ability to hold a first or second class license, will mean that the holder is a thoroughly competent man to have charge of engines and boilers.

It is lamentable that men holding first class licenses are often ignorant of some of the simplest details of their business. A man holding a first class license should be an engineer, and an engineer should know his business and be familiar with the details of the most common types of engines and boilers. This may be the rule in most cases, but that there are exceptions is shown by the following case, which came under my notice.

An engineer of our aquaintance holding a first class license, has in his plant a small 15 h. p. automatic engine. He desired to increase the speed a few revolutions and could not do it, or rather did not know how, and was obliged to call in another engineer to assist him. It was also desired to get a small amount of additional power from his engine as well as to increase the speed, but having sent for a brother engineer, and having been told by him how to do the work and accomplish both results, he dared not attempt to change his speed fearing he "could not get the governor right," and changed the pulley so the line shaft would run faster, and then said the engine did not give power enough to drive the machinery.

The builder of the engine called in one day, saw the conditions, got them to put the original pulley back, adjusted the springs and weights on the governor and gave them the required speed and additional power.

IKE CANN.

COLORS AND DYEING.

Dye Recipes for November.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $3.

RECIPE NO. 161.

Pearl on Worsted.

Wool Black 2 on 100 lbs. worsted yarn.

Prepare dye bath with

¼ lb. One-dip Wool Black 2.
(T. Bairstow & Co., 211 Pearl St., New York.)

½ lb. Oxalic Acid.

½ lb. Sulphuric Acid.

Enter in yarn at 110° F., give two turns, raise temperature to a boil while turning, and turn 3-4 hour at that heat.

Wool Black 2 is well adapted for dyeing fine, fast pearls, slates, etc., in one dip, which are very fast to fulling and light. A great variety of pearls, grays and slates can be dyed by using small amounts of dyestuffs; and with 13 to 17 per cent. of the dye, fine shades of fast and inexpensive blacks can be dyed in one dip. It penetrates the thickest fiber, and dyes perfectly level. It does not crock or rub off.

RECIPE NO. 162.

Dark Red on Worsted.

Acid Grenadine B on 100 pounds worsted yarn.

Prepare dye bath with

3 lbs. Acid Grenadine B.
(John J. Keller & Co., 104 Murray St., New York.)

10 lbs. Glauber's Salt.

5 lbs. Oil of Vitriol.

Enter in yarn at 130° F., bring to boil while turning, and turn to shade at that heat.

This is a full shade of Grenadine, showing a strong and evenly dyed color. Acid Grenadine B will be found very good for shading scarlets and other reds, as it will be found fast and easily worked. It is a useful color in itself and in combination.

RECIPE NO. 163.

Light Blue on Worsted Yarn.

Dark Blue on 100 lbs. worsted yarn.

Prepare dye bath with

½ lb. Dark Blue.
(Bosson & Lane, 36 Central Wharf, Boston.)

3 lbs. Sulphuric Acid.

10 lbs. Glauber's Salt.

Enter in yarn at 120° F., bring to boil while turning, and turn to shade at that heat.

Dark Blue will dye not only dark shades, but it will produce a fine shade of light blue with the use of a small quantity. The shade is much like that of an indigo blue. It works level, both for light and dark shades. (See Recipe 92 for a medium blue.)

RECIPE NO. 164.

Black on Worsted.

Acid Black 5534 on 100 pounds worsted yarn.

Prepare dye bath with

8 lbs. Acid Black 5534.
(Read Holliday & Sons, Ltd., 100 William St., New York.)

5 lbs. Sulphuric Acid.

10 lbs. Glauber's Salt.

Enter in yarn at 180° F.; bring to boil while turning, and turn to shade at that heat.

This dye is a new black on the market, and the result shown here represents it to be a very valuable acquisition to the line of acid dyes. It will combine well with other acid colors for shading. (See Recipe 151 for a dark blue.)

RECIPE NO. 165.

Orange on Cotton Yarn.

Acridine Orange G on 100 lbs. cotton yarn.

Mordant with tannic acid and tartar

emetic in the usual way, and dye with

6 oz. Acridine Orange G.
(C. Bischoff & Co., 87 Park Place, New York.)

Enter in yarn at 90° F. Bring up temperature to 120° F., while turning, and turn to shade at that heat.

Acridine Orange will be found to be one of the finest orange dyes for cotton. It is very soluble, and in combination with Rhodamines gives some excellent shades.

RECIPE NO. 166.

Navy Blue on Worsted Yarn.

Marine Blue on 100 lbs. of worsted yarn.

Prepare dye bath with

4 lbs. Marine Blue.
(The Stone & Ware Co., 157 Maiden Lane, New York.)
5 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter in yarn at 130° F., and bring up to boil while turning, and turn to shade at that heat.

This shade of blue has a good, bright and bloomy look. The dye does not snap on the fiber, but works on very slowly, which assures even shades. It is easily dissolved and does not crock or rub off. It is well adapted for raw stock, piece goods, and hosiery.

RECIPE NO. 167.

Black on Wool Yarn.

Soudan Black 2 on 100 pounds wool yarn.

Prepare dye bath with

2½ lbs. Soudan Black 2.
2½ lbs. Soudan Black 3.
(Sykes & Street, 85 Water Street, New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter in yarn at 140° F., bring to boil while turning, and turn to shade at that heat.

Soudan Blacks dye well with sulphuric acid and Glauber's salt. The baths are thoroughly exhausted, and a full shade may be had with, say, five per cent. of color, depending somewhat upon the shade of the stock used. Any kind of bath may be used, copper, iron or wood, and in this respect the product is very superior. These blacks are quite fast to light, air, and stand milling very well. (See Recipes 130 and 152 for blacks from Soudan Black 2 and Soudan Black 3, used alone.)

RECIPE NO. 168.

Light Blue on Cotton Yarn.

Direct Indigo Blue B K on 100 pounds cotton yarn.

Prepare dye bath with

½ lb. Direct Indigo Blue B K.
(A. Klipstein & Co., 122 Pearl St., New York.)
15 lbs. Glauber's Salt.
2 lbs. Sal Soda.

Enter in yarn at 140° F., bring to boil while turning, and turn to shade at that heat.

Direct Indigo Blue B K produces both light and dark shades of very fine indigo blues, which are fast. The color is very soluble in hot water, and will combine with all direct dyes. Direct Indigo Blues B K and B N will also dye wool and half wool, giving bright and fast colors.

RECIPE NO. 169.

Olive Green on Cotton Yarn.

Direct Orange and Green on 100 lbs. cotton yarn.

Prepare dye bath with

1½ lbs. Direct Orange.
½ lb. Direct Green Y.
(A. Klipstein & Co., 122 Pearl St., N. Y.)
3 lbs. Fankhausine.
10 lbs. Glauber's Salt.

Enter in yarn in dry state at boil, turn 1 3-4 hours at that heat, shut off steam and turn 3-4 hours longer. Lift and wash.

We have here, in combination, two dyes that have proved themselves useful in the dye house in many instances, and wherever used have been appreciated. Direct Green Y has appeared in a number of our recipes during this year, effecting most attractive shades, whether used alone or in combination with other direct dyes. We call attention to the following recipes: Nos. 3, 11, 17, 33, 119, 147.

RECIPE NO. 170.

Dark Red on Worsted Yarn.

Anthracenes on 100 lbs. worsted yarn.

Prepare dye bath with

1 lb. Anthracene Scarlet 6R.
½ lb. Anthracene Blue S.
½ lb. Anthracene Yellow T.
(Hanna-Schoellkopf Co., Philadelphia.)
10 lbs. Glauber's Salt.
2½ lbs. Acetic Acid.

Enter in yarn at 60° F. Bring slowly to boil, and turn to shade at that heat.

The dyes here used produce alone, and in combination, very fast colors. (See Recipe 77 for a yellow from Yellow T; recipes 89 and 90 for light and medium blues from Blue S; and Recipe 127 for a bright red.)

RECIPE NO. 171.

Green on Wool Yarn.

Alizarine Green C on 100 lbs. wool yarn.

Prepare dye bath with

10 lbs. Alizarine Green C.
(Farbenfabriken of Elberfeld Co., 77 William St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Oil of Vitriol.

Enter in yarn at 110° F., bring to boil slowly, and turn at that heat one hour. Rinse.

Alizarine Green C comes in the form of a paste, is very soluble, and dyes in one bath, as above, or can be dyed in a chrome and tartar mordant. Either way produces a fast and bright shade.

RECIPE NO. 172.

Black on Worsted.

Soudan Black B on 100 lbs. worsted yarn.

Prepare dye bath with

6 lbs. Soudan Black B.
(Sykes & Street, 85 Water St., New York)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter in yarn at 140° F., bring to boil while turning, and turn 1 1-2 hours at that heat.

Soudan Black B will produce a bluish shade of black. It dyes very slowly and level on the fiber. It is very soluble, and does not rub off. It is fast to mill tests.

RECIPE NO. 173.

Light Blue on Worsted.

Erioglaucine on 100 lbs. worsted yarn.

Prepare dye bath with

4 oz. Erioglaucine.
(John J. Keller & Co., 104 Murray St., New York.)
2 lbs. Oil of Vitriol.
15 lbs. Glauber's Salt.

Enter in yarn at 130° F. Bring to boil while turning, and turn to shade at that heat.

Erioglaucine produces fine shades of pure, greenish blues, very fast, and excellent for combining. It works on the fiber very slowly, thus insuring level shades. Erioglaucine can be dyed on a chrome mordant, either direct or for topping, giving bloomy and fast shades.

RECIPE NO. 174.

Black on Worsted.

Chrome Fast Black B on 100 pounds worsted yarn.

Prepare dye bath with

4½ lbs. Chrome Fast Black B.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
7 lbs. Oil of Vitriol.
10 lbs. Glauber's Salt.

Enter in yarn at 100° F., bring slowly to boil while turning, and turn one hour at that heat; then add 1 1-2 per cent. Bichromate of Potash to the bath, turn another half hour, at boil, and rinse.

The above black will be found to be an extremely fast one, standing soaping and light. It can be fulled along with white, and not stain it. The color lifts on very slowly and dyes the fiber evenly. With small amounts of color, fine grays and pearls, also slate shades, can be dyed. The color comes in the form of a dark brownish powder, and is very soluble in hot water. (See Recipe 149 for a slate.)

RECIPE NO. 175.

Black on Cotton Knit Goods.

Pluto Black G on 100 pounds cotton knit goods.

Make up bath with

6 lbs. Pluto Black G.
(Farbenfabriken of Elberfeld Co., 77 William St., New York.)
30 lbs. Glauber's Salt.
4 lbs. Soda Ash.

Enter cloth at boil, and run one hour at that heat.

Pluto Black will dye yarn, cloth, or raw stock, an even and full shade of fast black. The color works evenly on the fiber. It is very soluble.

RECIPE NO. 176.

Blue on Union Flannel.

Union Blue R on 100 lbs. mixed cotton and wool flannel.

Prepare dye bath with

2½ lbs. Union Blue R,
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
25 lbs. Glauber's Salt.

Enter in cloth at boil, and run one hour at that heat; then turn off steam and allow to run 1-2 hour longer.

Union Blue R is very soluble, and well adapted for dyeing mixed goods, as it dyes both fibers the same shade. It is fast, and works very level on cloth or yarn.

New Dyes.

We make use of a number of new dyes in our recipes this month, to which we direct particular attention on the part of dyers and manufacturers. Our Dyers' Supplement, consequently, will be especially sought for and appreciated.

In Recipe 161, we show a pearl color on worsted yarn, produced by the use of a dye obtained from T. Bairstow & Co., New York, called One-Dip Wool Black 2. This is a new one-dip dye, which comes to us well recommended for fastness, solidity, power of penetration, and the ease in dyeing level shades. It has been found fast to light, scouring and fulling, will not bleed; and can be safely used on raw stock, slubbing yarn, cloth, woolen and worsted piece goods and flannels. It dyes through any thickness of felt goods. For dyeing stockings it is recommended, as the cotton heel and toe are not stained.

In recipe 162, we show a beautiful shade of dark red, on worsted yarn, produced by the use of Acid Grenadine B, from Jno. J. Keller & Co., New York. We have used other brands of this dye for shades of red, as noticed in our Recipes 118 and 135. In this month's recipes we use the brand known as Acid Grenadine B. It produces a bluer shade than the brands used in former recipes. In recipe 173, we use another dye from the same house, called Erioglaucine, for the production of a light blue on worsted yarn. This dye gives, with the addition of a bright yellow, like Naphtol of Tartrazine, a perfectly level and bright green. The color is recommended for bright peacock shades. In the present instance, the dye is used, as stated, for a light blue.

C. Bischoff & Co., New York, furnish a dye known as Acridine Orange G, for an orange on cotton yarn, in Recipe 165. This dye produces brilliant shades, fast to light, etc. Attention is called to it for its fitness for combining with Rhodamine 3 G and 5 G, supplied by the same house. This dye is also intended for calico printing, and in combination with Rhodamines, in Aniline Black discharge work.

We show in Recipe 166 an excellent navy blue on worsted yarn, from the use of Marine Blue, sold by The Stone & Ware Co., New York. This dye has the especial property of a good and full bluish shade of navy blue, and is especially adapted for woolens and flannels.

In Recipe 168, a light blue on cotton yarn is seen, produced by the use of Direct Indigo Blue, B. K., furnished by A. Klipstein & Co., New York. This dye gives bottoming shades for blacks, dark blues and olives. The dye used in the present recipe is diazotizable. It is suitable for coloring cotton, wool and silk, and mixtures of the same. It may also be used in calico printing. It may be used in a single bath, like diamine or benzo colors; or it may be used in two baths by topping with bi-chromate of potash; or it may be dyed in three baths by diazotizing. The diazotizing process is done in the usual manner with ni-

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trite of soda, with the use of a developer. For wool and half-wool, this dye is best used with 20 per cent. Glauber's salt. The addition of a little borax or phosphate of soda produces greener shades, by causing more dyestuff to go on to the wool than on to the cotton. It is very soluble, colors evenly, penetrates the fiber thoroughly and does not rub off after dyeing. It is fast to acids, alkalies and sulphur, and is not affected by the mud of streets. Its fastness to light is the same as most other direct dyestuffs. We also desire to call attention to another dye procured from the same house, found in Recipe 169, for the production of olive green on cotton yarn, from Direct Orange in combination with Direct Green Y. The latter has already been used in former recipes, but Direct Orange is new. This dye is essentially a one-dip dye for cotton and dyes the latter in a bath containing common or Glauber's salt, at the boil. It will also color a mixture of wool and cotton with common salt in the bath.

We show a handsome black on worsted in Recipe 172, obtained from Soudan Black B, procured from Sykes & Street, New York. We have shown an excellent black in the use of other brands of Soudan Black, but brand B is new with us. We desire to call attention to it. This dye colors well in connection with sulphuric acid and Glauber's salt; works evenly at boil; and is very fast to light, air and soaping. It is a highly concentrated product, and is well adapted to yarn dyeing, and answers for piece goods admirably.

We think our readers will be much interested in the black on cotton goods shown in Recipe 175, obtained from the use of Pluto Black G, supplied by Farbenfabriken of Elberfeld Co., New York. This dye is highly spoken of wherever used in this country, and is referred to complimentarily in foreign technical journals. There are several brands of Pluto Black. All of them are homogeneous products, capable of dyeing blacks at a comparatively cheap rate. They dye unmordanted cotton from boiling baths containing Glauber's salt and soda, an alkaline bath giving the best results. Using from 6 to 8 per cent. of dyestuff, as shown in our recipe, good full blacks are obtained, while it is noteworthy that the dyebaths are fairly well exhausted of dye, so that the dyer may either run them away after use without much loss, or he may keep them standing for re-use for a considerable time. There is not much difference in the tone of the blacks which are not from the several brands. The one we use gives a deep shade with perhaps a faint brownish tone. Blacks obtained from this dye are quite fast to acids and strong soaping, and will stand rubbing and heating very well. It may be added that chroming after dyeing gives increased fastness to the shade. Coppering is of no value in connection with these dyes. The same house furnishes one of their dyes (Alizarine Green C) for Recipe 171, in the production of a green on woolen yarn. This is a new wool dyestuff of a clear green shade, which, on account of its great fastness to light, will be of considerable interest in wool dyeing. It can be used according to the one or two bath method. In the recipe that we have used, we have employed the former method. The shades obtained by these methods do not differ materially from each other. Neither in regard to fastness do they show any great difference. The fastness to light is exceedingly good, and the fastness to alkali and acid is sufficient for all general uses. Its fastness to milling is also good, and although in heavy milling it bleeds slightly on the white, it meets the ordinary demands in this respect in slubbing dyeing. It also stands the finishing process well. Considering that shades of great fastness to general wear can be produced by this dye in one bath, the product is undoubtedly interesting. This method of dyeing has the advantage of saving time, labor and steam.

A blue on union flannel is seen in Recipe No. 176, obtained from Union Blue R, furnished by the New York & Boston Dyewood Co., New York. This dye is especially adapted for the

coloring of mixed materials in one bath, and is valuable for union goods, as it colors both fabrics the same shade, thereby meeting the continually increasing requirements of one-bath methods of dyeing in producing useful union shades with one color alone. The application of this dye corresponds to the general methods of dyeing substantive colors and union material. The bath does not exhaust, and can be employed for further batches. It is particularly recommended for garment dyeing.

Round-about Notes.

The eternal microbe, it seems, has been called into requisition in Germany in the retting of flax. A chemist of the name of Fribes has found the bacillus which decomposes the pectine, that is to say, the woody outer covering of the stalk. He has cultivated this interesting germ in the usual manner and finds that he can rett flax with it perfectly in three days. Water retting amounts to a fermentation of the pectine, and the American process, which consists in adding water imported from Belgium, which has retted flax, to native waters, altogether unsuitable for the purpose, relies actually on the culture of the destructive microbe in water. As the retting is one of the most troublesome operations in the flax industry, the discovery of this bacillus is claimed by the "Chemiker Zeitung" to be a notable move in advance.

Molybdemim blue is a troublesome color, which has necessitated three separate processes hitherto, i. e., first, a bath of molybdate of ammonia, then one of hydrochloric acid, and finally one of stannous chloride. This three-bath process is enough to condemn the finest color for everyday use, but now a one-bath process is announced, which produces the shade every bit as well as the old method. The bath is made up of molybdate of ammonia and hydrochloric acid, then a bag filled with granulated tin is suspended in it, and the goods are entered. The bath is then gradually heated up, the action of the acid on the tin salt produces stannous chloride, which reduces the molybdate of ammonia in an equal and level manner, and the blue is precipitated in a nascent state on the fibre. It is a very fine shade and said to be very permanent. In fact, the method of dyeing is sufficient to show that it must be pretty resistant to exterior influences.

One of the German color firms has brought out a hair dye which is calculated to make Mrs. Allen take a back seat. The name, para-amido-diphenylamine is little against it for popular use, but by the time it gets to the hairdressers' this will doubtless be fixed up all right. However, this absolutely non-poisonous base is said to produce shades which are most closely akin to the natural dark-brown color of human hair. After application, hydrogen peroxide is used as a developer. The dyestuff, however, is of importance to the skin and fur dyer, or it would not be mentioned here. When used for skin rugs, furs, etc., the oxidizing agent may be permanganate of potash, or the hair may be steeped in a bath of equal volumes of para-amido-diphenylamine and hydrogen peroxide, and exposed to the air.

One of the new Hoechst colors, Alizarine Blue F, will be an important thing to the dyer if it can live up to the reputation the firm gives it. It is a blue for cotton which is said to be fast to bleaching. It is a very pure product, and is dyed on cotton treated with Turkey-red oil and a chrome mordant. The goods are steamed and soaped after dyeing. If the blue is really fast to chlorine, there is a future for it.

A French patent claims the production of some most remarkably cheap colors. A bath is made up of tannin and the salts of copper, nickel, chromium, iron, or manganese with sufficient sulphuric acid to prevent the formation of a lake. A number of dark shades can be produced in this way at a minimum of cost. For instance, a greenish shade of drab is got

with two pounds of tannin extract, 32 deg. Tw., half a pound of sulphuric acid, and half a pound of copper sulphate for every ten pounds of material.

It is sometimes useful to be able to tell whether a hempen or linen fabric contains jute. A French chemist gives a quick and sure method. First of all, a saturated solution of chloride of lime, hydrochloric acid and ammonia is prepared. Then the fabric to be examined is unpicked and the threads are untwisted so that the fibers are perfectly open and separated one from the other. The thread thus prepared is put into a saucer, sprinkled with chloride of lime solution, and worked so that every fibre is thoroughly soaked in it. A few drops of hydrochloric acid are then added, a slight effervescence is produced, the liquid takes a yellowish-green color, and the fibers bleach almost instantaneously. The yarn is at once washed thoroughly, and carefully wrung, then put into a clean saucer and moistened with a few drops of ammonia. The following reaction then takes place: The jute fibres take a blue-red color, the hemp and flax take a yellow tint streaked with pink. If it is a mixture and the fibres are well opened out, the eye can distinguish the filaments of jute, and of hemp or flax, by their color. This coloration must be examined for immediately after the addition to the ammonia. The distinctive shades soon merge into a dark reddish-gray tint, common to all three fibres.

Bleaching.

WITH PEROXIDE OF SODIUM.

Editor Textile World:

It may interest many of your readers to hear how and to what extent peroxide of sodium is used for the bleaching of textiles both here and in Europe. The "how" I answer from personal experience, while the other information is gathered from trustworthy sources.

For cotton, peroxide finds but limited use, so far, for general bleaching, though many of the finer imported cotton fabrics, such as curtains and laces, readily give proof by their strength that this chemical has been employed for their bleaching. Notwithstanding that the European manufacturer is obliged by the force of circumstances surrounding him to work much more economically than the American, yet it is Germany which has most largely adopted this new agent also for cotton.

Germans were, moreover, the first to experiment with and introduce it in the treatment of wool, woolens and mixed goods; but for these classes, I think, the Americans are rapidly decreasing their lead. For the bleaching of raw wool, comparatively little peroxide of sodium is as yet used though there can be no doubt that in the near future wool will have its first bleach in the raw without being injured in the slightest nor "felted" to any appreciable extent. Its treatment with peroxide is gentle, of short duration and calling for few handlings. It therefore leaves the bleaching bath unchanged with the exception of its color. The raw wool so prepared enters the further manufacturing processes with a lighter base color, on which account the finished cloth or felt needs but a short treatment with the chemical to produce a magnificent white.

Up to now, woolen fabrics must be subjected to the full bleach, which of course takes a somewhat longer time than if the raw stock had a preliminary treatment with peroxide. The baths also are made up stronger, and in some instances need to be repeated, to obtain the best effect. While in Germany the majority of woolens are treated with this chemical, it also now makes its influence felt in this market to an appreciable degree, and what I hear among the mills leads me to believe that our German cousins will not be permitted to retain for any length of time the supremacy due to their quicker decision, in adopting the sodium peroxide method.

Its field, par excellence, however is in the bleaching of mixed goods—cot-

ton mixed with wool, silk or hair and also mixtures of the latter three with flax, hemp, jute or other vegetable fiber. It stands to reason that fibers of vegetable origin will not be benefited, but certainly injured by treatment with sulphurous acid, either in the form of burning sulphur, as a solution, or generated by mixing bisulphite of soda with muriatic acid. Cotton, etc., is quickly acted upon by sulphuric acid, into which the sulphurous acid, left on the goods in bleaching, readily turns. On the other hand, it is almost suicidal to bleach wool with any of the "chlorides," the animal fibers being tendered and discolored by contact with them. For these goods peroxide of sodium has indeed filled "a long felt want," and hosiery companies therefore are almost without exception large consumers.

As to the "how," the first recipes, published in various essays, called for enormously strong baths, which, though they did not hurt the goods bleached, yet made the process quite expensive. This error probably resulted by authorities not clearly comprehending the tremendous amount of oxygen gas peroxide of sodium is capable of developing. It is evident that only such a proportion of the bleaching agent should be used, the oxygen of which will be sufficient to combine with all the coloring matter on the fiber. If there is more peroxide present, the gas finds no work to do, and escapes. Thus, for instance, where formerly 3, 5 and even 10 per cent. baths were prescribed, the same work is now done with ⅛, ½ or 1 per cent. baths, though the recipes in other respects remain about the same. It has further been ascertained that for the decomposition of the peroxide, oxalic acid gives much better results with the animal fibers, while sulphuric acid should be employed for the vegetable fibers.

If the process has been cheapened by cutting down the strength of the bleaching bath, it has on the other hand been made slightly more expensive through observation that the goods turn out more beautifully if they are rinsed more frequently. Thus a washing in hot water is of advantage when taking them out of the bleaching vat, and a thorough washing should wind up the process. Some bleachers finish the operation with a soap and ammonia bath, which may have the effect of softening the goods.

G. W. K.

Waste.

Waste, for convenience, may be divided into two kinds—visible and invisible. First, then, there is the visible waste, which is made during the preparation of the yarn for the looms; as waste in winding, which includes cop bottoms, spoiled cops, and broken ends; waste in warping, including the piecing of ends and material left on bobbins, which cannot be used without considerable trouble; waste in slashing, which principally consists of the amount lost when starting a new set of back beams, and the waste connected with finish of one warp and the commencement of another at the loom.

What has been termed invisible waste comes next, and by this is meant something which is actual loss in one way or another; for example, take excess moisture. Now it is very evident if yarn is bought which contains more moisture than is a natural constituent of the fibre that, during the preparation processes, this will evaporate and will thus represent waste, consequently, yarn should be tested for moisture in the manner indicated in a previous article in this series.

Again, a variation in the count of yarn from the standard really amounts to waste, because if the yarn is too coarse, the calculated weight will not produce the requisite length, hence, more material is necessary; if the yarn is too fine the cloth would be lighter, though, as a rule, a manufacturer prefers having the twist on the higher count side, as by this means he obtains a greater length of yarn for a given weight.—[Textile Recorder, England.

QUESTIONS AND ANSWERS.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Theory of Dyeing.

Editor Textile World:

Will you inform me what is the most generally accepted theory of dyeing, whether mechanical or chemical?

New Hampshire. R.

In reference to the mechanical or chemical theories that are referred to, in works on dyeing, we think that the latter is the more generally accepted for wool, while the theory pertaining to the dyeing of cotton remains uncertain.

Finishing Cotton Goods.

Editor Textile World:

I should be pleased to receive any information that you may have of a book, up to date, on finishing cotton goods, calendering, starching, etc.

New Brunswick. C. H. D.

We know of but one work that covers this subject in anything like a complete form, and that is one by Joseph DePierre on "Finishing Cotton Goods," published in 1889, being a translation from the French. The book has 480 pages, and is 8 vo. The first chapters take up substances employed in finishing, as thickenings, starch mixtures, softenings, colors, chemicals, etc., and methods of using them. Then follow chapters on machines employed, and on chloring and blueing, mould formation, and mildew. There is an excellent work, published in 1895, good to-day, of 262 pages, 8 vo., by Davis & Dreyfus, on "Sizing and Mildew in Cotton Goods."

Books for Cotton Spinning.

Editor Textile World:

Your recommendation of books to "A. G." relating to worsted, is exactly what I want. I have been imposed upon with books that are not new, and I want some up-to-date, helpful books, and, if possible, text books such as are used in Textile schools.

There are several good books on cotton spinning and manufacturing that have been published of late that may be considered up-to-date. There will be no mistake in purchasing the following: "The Students' Handbook of Cotton Spinning," by Joseph Nasmith, and "Cotton Spinning," by W. S. Taggart, the first two volumes of which have been published, the second volume having been noticed in our last month's issue; "Cotton Weaving," by R. Marsden, and "Cotton Spinning," by the same author; "Cotton Weaving and Designing," by John T. Taylor; "The Students' Hand-book of Practical Fabric Structure," by H. Neville. The works by Taylor and Neville are for mills that have a diversified product, more than for those on plain goods alone.

Shuttle Machinery.

Editor Textile World:

Can you give me the address of a manufacturer of machinery for making bobbins for cotton mills?

So. Carolina. H. F. W.

Write to G. N. Goodspeed, Winchendon, Mass.

Amoskeag Manufacturing Company.

Editor Textile World:

I notice that there has been of late considerable comment made concerning the late financial statement of the Amoskeag Manufacturing Company, Manchester, N. H. Can you furnish me with the statistics that appeared in the annual report of the treasurer?

Connecticut. D. G.

The following statistics appeared in the annual report of the treasurer:

Yards of cloth manufactured	95,303,110
Net earnings for the first six months	$80,433 33
Net loss on second six months	3,815 33
Total net gain for year	76,618 00
Less 5 per cent. dividend	200,000 00
Total net loss on year	123,382 00
Mill closed down seven weeks during Autumn, 1896.	
Mills closed down during August, 1897.	
Stock considerably reduced during year.	
Permanent investment	3,000,000 00
Total capital invested	3,508,449 52
Balance credit, profit and loss, after dividend	1,325,439 21

Jacquard Loom.

Editor Textile World:

Can you tell me when the jacquard loom was first used, and how many kinds there are?

Rhode Island. W. S. W.

This machine was introduced into England about 1818, but did not come into any extended use until 1828, or 1832.

There are single acting, double acting lift, double acting with double cylinders, and twilling jacquards. These are the principal kinds of machinery made, but there are other varieties constructed for special purposes.

Wool Manufacturing in France.

Editor Textile World:

Will you give me the relative statistical status of wool manufacturing in France and the United States?

New Jersey. T. F. B.

The only comparative figures are those of 1890, taken from the U. S. Census of 1890, and from the statistics furnished by the French Department of Foreign Commerce and other official sources. The U. S. Census gives the total value of the products of the woolen industry at $338,000,000; the number of employees, 219,132; number of looms—29,000 broad, 30,000, narrow, and 8,000 carpet; total 67,000; wool consumed 373,000,000 pounds. The statistics of France are as follows: employees 115,000; number of looms—46,000 power and 25,000 hand; wool imported for home consumption, 400,000,000 pounds

Round Bale.

Editor Textile World:

Can you inform me whether spinners are taking or using the round bale? If so, is it meeting with favor? Where are the compresses being established in the Southern States? How many bales can one of the compresses with gin attachment turn out?

New York. R. T. N.

We do not think that the spinners are buying to any great extent cotton done up in the cylindrical form. At any rate, very little has passed into consumption, up to date; still, these bales are being made, and, we understand, stored, for some purpose. What the company's policy is for doing this, we do not know. So far as we can learn, spinners that have used cotton done up in this form, speak of it favorably. Spinners will encourage anything that will improve the packing of cotton. Compressing plants are located at three shipping points: in Alabama; one in Arkansas; one in Georgia; one in Louisiana; seven in Mississippi; one in South Carolina; six in Tennessee; and five in Texas. We have no reliable data that gives the number of bales that a compress with gin attachment will turn out. We have an account from the Secretary of the Chamber of Commerce at Huntsville, Ala., to the effect that four gins with one compress will take the seed cotton from the farmer's wagon, gin, compress it, and turn out a completed bale inside of fifteen minutes. This is at the rate of four bales an hour, for four gins, or one bale an hour per gin, equalling ten bales in ten hours, or one day's running.

Cotton Statistics.

Editor Textile World:

Will you kindly answer the following queries? I should like to obtain the amount of cotton grown in the several countries of North and South Carolina and Georgia. What has been the highest and lowest price of cotton since 1850? What is the consumption of cotton in the world, giving that of Great Britain, the Continent and the United States, in total?

Pennsylvania. J. M. N.

There are no official statistics of the growth of cotton in the several counties of the States named, except those to be found in the Census Reports of 1890. None of the States mentioned attempt to procure this information, and we do not think it can be obtained from any reliable source. The lowest price touched by middling cotton since 1850 was in 1894 and 1895, when it sold at 5 9-16 cents, and the highest price was obtained in 1864, when it sold for $1.90, but as this was on an inflated currency basis, which continued until 1879, we might say that the highest price was in 1857, when it touched 15 7-8 cents. The consumption of cotton in the world, according to the recent figures of Ellison & Co., for 1896-97, was 11,334,000 bales, of the uniform weight of 500 pounds, divided as follows: Great Britain, 3,224,000; the Continent, 4,368,000; the United States, 2,738,000; India, 1,004,000.

Economic Subject.

Editor Textile World:

Will you be kind enough to fill in answers to the enclosed questions relating to the cost of production of wool, cotton and knitted fabrics?

Connecticut. E. H. W.

Our correspondent has asked us to undertake something that would require a great deal of time and research. It took the N. E. Cotton Manufacturers' Association two years to find out a proper system for ascertaining the cost relating to the production of cotton fabrics. Of course, every manufacturer has a method of his own. Perhaps some of our readers would like to undertake to answer one of our correspondent's questions, relating to the production of cotton goods. For instance: Quantity of goods that men and girls will produce in a day of ten hours, expressed in yards, giving width; cost of goods from the raw material or from the yarn; rough estimate of the cost of machinery necessary to produce the goods. We will state that this comes from one that is studying economics, and the information is desired, as we understand it, for an economic thesis. It is possible that our correspondent can get much desirable information from the following

sources: U. S. Census Report (1880), Vol. 22, giving statistics of labor, commerce, wages, efficiency, cost of labor per unit of production, percentage of labor to cost. "Seventh Annual Report (1892) of the Commissioner of Labor; Tariff Hearing before the Ways and Means Committee, First Session, 53rd Congress, 1893," page 720. These latter two furnish statistics on the cost of production and labor. Also the "Mass. Bureau of Statistics of Labor," 1890, showing net profits of manufacturing; and the proceedings of the Cotton Manufacturers' Association for April 1893. Valuable matter on this subject, though applicable to foreign conditions, is to be found in the "Cotton Trade in England and on the Continent," by Dr. G. von Schulze-Gaevernitz.

Public Debt.

Editor Textile World:

Will you inform me what the debt of the United States is and of what it consists, briefly stated.

New Hampshire. C. J.

The aggregate of the interest and non-interest bearing debt of the United States on August 31, 1897, was a little over $1,200,000,000. Seventy per cent. of this is interest bearing: 4 per cent. authorized by Acts of 1870-71, and 4 and 5 per cent. authorized by the Act of 1875. Thirty per cent. of the debt is non-interest bearing, made up chiefly of United States notes, authorized by acts of 1862-63.

Leaf Fiber Machinery.

Editor Textile World:

Can you inform us where we can buy new machinery for the complete manufacture of heavy sacks, commonly used for ore, salt, grain, etc., and for floor matting, rolls for packing cotton, etc., also for rope, all to be made from Ixtle and Pita fiber from the Lechuguilla and Maguey plant, that are so abundant here?

Coahuila, Mexico. D. E. & Co.

The fiber referred to by our correspondent belongs to the fleshy-leaved Argave plants. For working the fiber, there has been attained a considerable degree of success, of late, in the mechanical processes. Both the Lechuguilla and Maguey plants belong to the genus Argave, of which the Ixtle and Pita are simply species or varieties. The machinery required for the manufacture of these fibers into the products named, consists first of an extractor, the most improved and reliable one being that built by J. C. Todd, 203 Broadway, New York, which takes the leaves in at one end, rasps the pulp off the fiber, and delivers the fiber at the other end. This machine, it is said, will produce nearly a ton of fiber a day. Another fiber extractor, considerably cheaper, is that built by T. Albee Smith, Baltimore, Md. The remainder of the machinery required will, in a large measure, be determined by the quality and length of fiber employed. If the fiber is short, more machinery will be required than if it is long. The machines that would be required in any case would consist of a spreader, drawing frame, spinning jenny, former, cordage machine, and looms. All of these are built by J. C. Todd, 203 Broadway, New York, and W. C. Boone & Co., 41 Dey St., New York.

Recent Sales o Mi Shares.

	Lowest	Highest
Border City	125	126
Cornell	113	115
Richard Borden	110	110
Shove	110	111½
Wampanoag	110	110
Amory	144¾	145
Continental	19	20¼
Lyman	70	70
Wamsutta	99⅞	99⅞
York	750	752½
King Phillip	100	100
Laurel Lake	93	93
Edwards	151½	155¾
Lowell Bleachery	106¼	106¼
Appleton	422½	422½
Chicopee	50½	60
Franklin	102	103¼
Boott	1085	1095
Slade	110	110
Amoskeag	1505	1522½
Bates	113	114
Newmarket	200	200
Lancaster	356¼	357½
Nashua	510	512
Great Falls	140	140
Davol	100	100
Seaconnet	103½	103½
Stafford	107	107
Union	155	155
Lawrence	120	120
Manchester	106½	102
Arlington	105	105
Lowell	520	520
Merrimack	1100	1100

New Publications.

Bleaching with Peroxide of Sodium—The Roessler & Hassacher Chemical Co., 100 William St., New York, has just issued a handsome pamphlet of twenty pages, giving some highly instructive information concerning Peroxide of Sodium and its use for bleaching. This is a second and enlarged edition of a former pamphlet on this subject. The pamphlet covers such matters as those relating to the objections to present processes in bleaching, comparison of hydrogen peroxide and peroxide of sodium, and the proof of general utility of the peroxide of sodium processes, besides sketches of bleaching apparatus. It would be worth the while of bleachers to write for this pamphlet, as many of the objections relating to the use of peroxide of sodium will be cleared away after a perusal of it. General rules are given for the handling of this bleaching agent, showing how to prepare a proper bath, and what preparation goods should undergo before bleaching. Certain recipes are also given.

Ornamental Design for Woven Fabrics—by C. Stephenson and F. Suddards. London: Methuen & Co., 273 pages; 66 illustrations. Price $2.50. This is a text book dealing with ornamental designs for woven fabrics for the use of the student.

Mr. Stephenson is attached to the Bradford school, and Mr. Suddards to the Yorkshire College, Leeds. The work is not intended to cover the whole subject of ornamental design, but has been written for the purpose of suggesting helpful ideas to designers and manufacturers of textiles, and aims at bringing artistic textile work into practical touch and closer relationship with the technical requirements of manufacturing. It takes up such subjects as Geometric Design; How to Plan an All-Over Repeating Design; The Drop Pattern; the Sateen Arrangements; Borders, Corners, Stripes; Why Nature Should be Conventionalized; The Structure of Ornamental Flowers, Foliage, etc.

Hand-book of Cotton Crop Statistics—printed and published by John Jones, 3 Browns Building, Liverpool. This is the 27th year publication of this hand-book giving statistics relating to the cotton crops of the United States, India, Egypt and Brazil, together with much useful information for the cotton trade. The representatives of the publishers in this country are the Commercial Telegram Bureaux, 19 Beaver St

United States Customs Tariff—published by R. F. Downing & Co., 11 William St., New York. This work is issued by a well known firm of cotton brokers and general merchandise forwarders, and contains a full copy of the customs tariff act of 1897, and the customs administration act of 1890, as amended by act of July 24, 1897. The tariff schedule has been prepared most carefully. The book tells what "market value" is for import purposes, rules for ascertaining duties, payment of duties, suits for the recovery of duties illegally exacted, drawback customs duties, advice to foreign tourists and emigrants, etc.

Gould's Pumps—The Gould Manufacturing Co., Seneca Falls, N. Y., have issued a supplement (No. 4) to their 1896 catalogue, bringing their literature relating to water wheels up to date. The additions that are represented in this supplement are varied and new goods are shown in all departments. New double acting wheel pumps and triplex power pumps occupy a considerable part of pages, and are worthy of special attention.

Turbine Water Wheels—The C. P. Bradway Machine Works, West Stafford, Conn., have issued a catalogue relating to their turbine water wheel, which is so highly spoken of by those who have used it, because of its construction on scientific principles. The wheel is warranted to give the greatest amount of power with a variable supply of water. The wheel is built to suit all requirements, and can be adapted to any place where a water wheel can be used, by being built to run to either a vertical or horizontal shaft, and either one, two or three wheels on one base.

Alizarine Lanacyl Colors—Leopold Cassella & Co., for whom Wm. J. Matheson & Co., New York, are agents, have issued their catalogue of these colors which have been put on the market in response to a desire on the part of wool dyers for dyestuffs which can be simply dyed in an acid bath, full dark blue shades, fast to light, and which do not rub off. The principal value of these colors is their usefulness for dyeing piece goods; also for yarn dyeing.

Appleton's Popular Science Monthly for October, 1897.—Prominent among the articles of special interest is Prof. William Z. Ripley's paper on the Racial Geography of Italy, in which he takes up the much disputed question as to the origin of the ancient Etruscans. Franklin's Kite Experiment with Modern Apparatus, describes some interesting electrical phenomena, and shows the importance of the kite in modern meteorology. The Psychology of Belief, is an interesting contribution to the new psychology. David A. Wells has an important article on Present Methods of Taxation, which shows the injustice of the present system, and traces it to the notion that in order to tax equitably it is necessary to tax everything.

Cassier's Magazine—for October. Published by the Cassier's Magazine Co., World Building, New York. Price 25 c. per number. This number is gotten up in the usual style as to illustrations and typography, characteristic of this magazine. It always comes elegantly illustrated. The present number has articles on the following subjects: Turbine Building in Switzerland—European and American methods contrasted, with 12 illustrations; The Story of the Oil Fields—the early days of oil well exploitation in the United States, with 11 illustrations; Is the Inventive Faculty a Myth?—an exposition of inventive reasoning, with 15 explanatory sketches; Corn as Fuel—its thermal value compared with coal; Electric Power in a Great Railway Shop—an interview with F. W. Webb, chief mechanical engineer of the London & North Western Railway, with 9 illustrations.

Vulcanized Rubber Goods—The New Jersey Car Spring and Rubber Co., Jersey City, N. J., has just issued an attractive catalogue relating to their business, covering manufactures of seamless tube, and other rubber, hose, endless belts, steam packing, piston packing, flax packing, gaskets, rubber tubing, car springs, rubber mats of all kinds, flexible rubber play pipes, etc. for fire purposes, and other things of this character. This company was incorporated in 1858, and is one of the oldest manufacturers of rubber goods for mechanical purposes in this country. The factories of the company are equipped with the most improved machinery.

Systematic Survey of the Organic Coloring Matters—by Drs. G. Schultz and P. Julius, London and New York: Macmillan & Co., 1894, 4 vo., 205 pages. This is a work that has been before the trade for the last three years, but we allude to it at this time because of its merits as a technical treatise for the chemist and others concerned with the production, handling or use of the coal-tar colors. Particularly is its value deserving of recognition because of the rapid progress of the coal-tar color industry and the continued increase in number and complexity of the products employed in the tinctorial arts, which renders a knowledge of the chemistry and technology of these products of increasing importance. Only those methods are described which are practically employed, and no mention is made of merely laboratory work or of abandoned processes.

Alizarine Black-Bayer—The Farbenfabriken of Elberfeld Co., New York, has issued a circular in reference to a dye offered by it, named Alizarine Black-Bayer. Diamond Black is another and more scientific name for the article. It is adapted for woolen fabrics, and has already been largely adopted by woolen mills in this country. It is recognized on the dyed goods by the muriatic acid and tin crystals test, which turn the black into gray, just as the fast indigo blue is turned yellow by nitric acid. Sunlight and weather exposure do not affect it.

Anthracene Yellow R—A pamphlet referring to this dye has just been issued by Wm. J. Matheson & Co., Ltd., New York. The properties of this dye are fastness to light, stoving and milling. The methods of dyeing with it are similar to those used in connection with Anthracene Yellow C, but darker shades of orange are produced. It is used on wool.

Egyptian Cotton Crops—We have received from Stoddard, Haserick, Richards & Co. (importers of Egyptian cotton), Boston, Mass., a handsome halftone illustration, on card board, of an Arab seated upon a camel, on the obverse, and on the reverse, statistics relating to the cotton crops of Egypt since 1875; total shipments from Alexandria; and direct shipments to the United States; arranged for hanging up in the office.

Industrial Notes.

—The roof of the new Spence Library of the Union Theological Seminary, at Richmond, Va., will be of fire proof construction. The trusses will be of steel, and the covering slate attached directly to metal supports. One end of the building is round, making a conical shape roof, and at various points of the roof slope are placed dormers and skylights. The peculiarity of the construction makes the iron work very intricate in order to get the pleasing, architectural appearance desired. The contract for furnishing and erecting the steel work for the roof has been given to the Berlin Iron Bridge Company of East Berlin, Conn.

—Edward T. Steele & Co. have moved their New York office to 53 Leonard St., directly opposite their former location. The management of the New York office will be under the personal supervision of Warner J. Steele and Arthur M. Cox.

—The Parks & Woolson Machine Co., Springfield, Vermont, have just received orders from the following parties: J. E. Moore & Co., the Cumberland Finishing Works, of Philadelphia, for one of their worsted polishing machines; George K. Gilbert Manufacturing Co., Ware, Mass., for a shear; The Thomas Kay Woolen Mill Co., Salem, Oregon, for a double cylinder gig (a new wire teazel cleaner that is highly spoken of); W. P. Hewitt & Co., Menasha, Wis., for a measuring, doubling and rolling machine; The Algonquin Co., Passaic, N. J., for two double cylinder teazel gigs; The Fitchburg Worsted Co., Fitchburg, Mass., a worsted polishing machine; Sawyer Woolen Mills, Dover, N. H., a brushing machine; Lawrence Dye Works, Lawrence, Mass., a brushing machine; C. H. & F. H. Stott, Stottville, N. Y., a shear, gig, and combination napper and gig; Joseph Wild & Co., Brooklyn, N. Y., a 75-cut double shear.

—An expert cotton mill man says: "The Draper loom is revolutionizing cotton fabrication. The East will have to get these looms at an enormous expense for replacement. The new cotton mill at Gaffney City started with these looms and a fat dividend was the result, the first running year."

—The Fuel Economizer Co., of Matteawan, N. Y., have moved their Boston Office in the Exchange building, to Room 1039 on the tenth floor. The new quarters are more pleasant and commodious.

—The M. A. Furbush & Son Machine Co. have one of their Murkland high speed ingrain carpet looms in operation at the novelties exposition in the Bourse, from Oct. 15th to Dec. 15th, on the new Heald et Arras weave. The loom is operated by an electric motor. Upwards of 5,000 of the Murkland looms are now in operation.

—The second term of the Lowell Textile school opened Oct. 4 with literary exercises. President A. G. Cumnock, Charles L. Hildreth, agent of the Lowell machine shop, Thomas Walsh, superintendent of the Hamilton print works, and numerous other gentlemen prominent in manufacturing circles, were present, together with the pupils and a large company of relatives and friends. An hour or more was given to an inspection of the school's equipment, after which an address was made by C. J. H. Woodbury, secretary of the New England Cotton Manufacturers' Association.

—The fact of there being over 40 out of town students at the Textile School coming from all parts of the Union was considered by the ladies of Lowell as a fitting opportunity to extend their welcome. This took the form of a reception, which took place at the school on the 20th inst. The school was converted for the time being into a handsome suite of reception rooms, the class rooms into refreshment and cloak rooms, and the students were met by between four and five hundred citizens. After all had partaken of refreshments the guests departed, all feeling that the event had been a very happy indication of the interest that is felt by the citizens in the Lowell Textile school.

—Weimar Bros. manufacturers of silk and cotton bindings, have recently removed from Hope & Huntington Sts. to 1817 E. York St., Philadelphia. In their new quarters they have more room, necessitated by their growing business.

—The Jonesboro Yarn Mills, Jonesboro, Tenn., have placed an order for speeders and the Eagle & Phenix Mfg. Co., Columbus, Ga., for drawing frames with the Howard & Bullough American Machine Co., Pawtucket. These frames will be complete with the Patent Electric Stop Motions.

—The Clark Thread Co., Newark, are now having erected at their mills a number of revolving flat cards, which are being built by the Howard & Bullough American Machine Co., Pawtucket. This is the third order for these machines which they have placed for their Mile End Mill.

—There was a large gathering of overseers of the different woolen mills in Eastern Maine, October 4, at Newport. It was the first gathering of the kind that ever took place. The party was well entertained by the citizens of the town. The object of the gathering was to form an organization to be known as the Woolen Overseers' Association of Eastern Maine. The folowing officers were elected: president, Chas. Stone, Dover; vice president Edward Leech, Skowhegan; secretary, L. C. Sawyer, Dover; treasurer, T. E. B. Knowles, Pittsfield; corresponding secretarys, L. Coburn, Skowhegan; Wm. McFarland, Pittsfield; H. Taylor, Dover; George Cathcart, Old Town; Edward Varney, Hartland; George T. Davidson, Guilford and Sangerville; Wm. Davidson, No. Dexter; S. J. Hall, Dexter; A. D. Mansell, Newport.

—The Walter M. Lowney Co., well known chocolate manufacturers of Boston, who are building a modern factory in that city, placed their contract for the Green Economizer with H. G. Brinckerhoff, the Boston manager of the Fuel Economizer Co., of Matteawan, N. Y.

—President McCullom, of the Tracy Worsted Mills, Philadelphia, returned home Oct. 20th from the Virginia Springs, Va., where he has passed part of the autumn in rest and recuperation. The Tracy Mills are running full time, with handsome orders booked ahead. Treasurer Pitkin expressed the belief that the revival of business would not prove temporary.

—Visitors to the machinery depot of Frank Toomey, 131 North 3rd St., Philadelphia, will be impressed with the office improvements and elegant enlargement of the premises. Mr. Toomey has long felt the need of more show room accommodation. Both of the large stores, now devoted to various kinds of power machinery, are fully stocked. His office is much enlarged, and is well lighted.

—Comstock, Cheney & Co., of Ivoryton, Conn. are erecting a fireproof building about 50 ft. long. The side walls of this building are brick and the roof is constructed of iron. The covering is corrugated iron lined with the Berlin Iron Bridge Company's anti-condensation fireproof roof lining.

—The Berlin Iron Bridge Company have a contract for furnishing and erecting the structural iron work of floor and roof for a cow barn for the Connecticut Hospital for the Insane, at Middletown, Conn. The building is 50 ft. wide and 200 ft. long.

—A notable addition to the already extensive electrical plant of the Niagara Falls Hydraulic Power and Mfg. Co. in the power house at the foot of the cliff, at Niagara Falls, N. Y., will shortly be made in the form of a General Electric Co. electrolytic generator, which will be the largest of its kind ever constructed. It will be both liberally and carefully designed to enable it to cope with the very severe service of electrolytic work, i. e., for practically continuous operation. This machine will have fourteen poles, and will run at 257 revolutions, giving an output of 5,000 amperes at 175 volts, or a capacity of 875 kilowatts. It will be of the latest type, and will be directly connected to the water wheel shaft. It will be provided with a special panel switchboard with full form K equipment of instruments necessary to handle a current of 5,000 amperes. The General Electric Co., is already well represented in the power house of the Niagara Falls Hydraulic and Manufacturing Company. Two of its six pole 560 K. W. 300 revolution, 650 volt railway machines, both directly coupled to the same turbine shaft, supply current to the Great Gorge Railway. In addition the station contains a G. E. booster and two other generators, one of 100 and one of 90 K. W.

Hartford Steam Boiler Inspection and Insurance Co.

The Hartford "Courant" says: "Thirty years ago Jeremiah M. Allen entered upon the duties of president of the Hartford Steam Boiler Inspection & Insurance Company. At that time it was an experiment, laughed at by many business men, and unsuccessful in its brief career of about a year. The organizers were meditating the redistribution of its $100,000 paid in capital and the dissolution of the concern. To-day, after thirty years of Mr. Allens' management, its cash capital is $500,000, its assets exceed $2,000,000; and something like 62,000 boilers are insured in the company. No manufacturer sleeps easy nights unless his plant is protected by this insurance, and the company has become an indispensable factor in the manufacturing industry of the country.

"All this Mr. Allen has brought about by his firm belief in the possible usefulness and real advantages of such a company, and the tact and intelligence with which he has conducted it. Its business is different from ordinary insurance. In that, the most of the money is spent to pay for losses. In this case, the outlay is to prevent loss. The boilers are all inspected and tested, and the usefulness of the company is largely measured, not by the losses it pays, but by the cases in which there is no loss. Its money goes to maintain a small army of skilled employes, who keep everything up to standard and prevent explosions. But when there comes a loss, it is promptly met.

"Out of the business of inspecting manufacturing plants there has developed the further business of designing them. Mr. Allen's company does a great deal of this work and he is consulted by manufacturers all over the country. He is a recognized authority upon all such subjects as he is in many other lines of scientific research.

"Mr. Allen has taken a large place in the life of Hartford. The experimental company that he believed in when others laughed, has become one of Hartford's most famous and successful enterprises. He is also a director in the Orient Fire Insurance Company, the Connecticut River Banking Company, and the Security Company. In 1888, when the Hartford Board of Trade was organized, Mr. Allen was chosen its president, and he still holds the office. Though he has twice tried to resign, the directors insist upon his remaining. His personal popularity is large and it is well known that he would have been Mayor of the city, if he had not positively declined to be a candidate. He was born in Enfield in 1833, but has lived in Hartford since a young man."

A Branch Store at Chicago for the New Jersey Car Spring & Rubber Co.

The New Jersey Car Spring & Rubber Co., of Jersey City, N. J., is about to open a splendidly equipped store at 175-177 Lake Street, Chicago. This fine double store has been remodeled and fitted up in a most thorough manner.

A complete stock will be carried, including the full line manufactured by this well-known concern, and will include all the different grades of hose, belting, packing, mats, mattings, linen and cotton hose, etc. The stock of belting will be especially full, and any size or ply will be found in stock, including the popular "Gladiator" Quilt Stitched brand.

The New Jersey Car Spring & Rubber Co. is one of the pioneers in the trade, having been established since 1858. They are progressive, and have a fine up to date plant, with every new appliance in the way of machinery to make their goods quickly and well, and the opening of the Chicago store is looked for with interest by the trade. The store will be conducted under the management of Frederick G. Davis, who is well and widely known by buyers and users of mechanical rubber goods. Mr. Davis brings to his duties an extensive experience, and as the products of the New Jersey Car Spring & Rubber Co. are of known reputation and worth, the success of this new move of the company seems assured from the start.

Albion Dye and Bleach Works.

G. J. Littlewood & Sons, Limited, proprietors of the Albion Dye & Bleach Works, Manayunk, Philadelphia, announce their business on page 138 in this issue. These works were established nearly thirty years ago by Graham J. Littlewood, and during the many intervening years have held a high position in the dyeing industry. The special line of work is dyeing cotton, cotton yarns, wool and raw stock generally, and bleaching cotton and cotton yarns. The equipment for such work is complete in every department, the very best modern machinery being used throughout, and a practical knowledge of every detail in manipulation being brought to bear.

The founder of the business trained his sons to thoroughly understand the principles of dyeing and bleaching; and when a year or so ago he relinquished active hold and proprietorship, the management went into competent hands.

The firm is now composed of J. T., A. R., and G. G. Littlewood, sons of Graham J. Littlewood. Mr. Littlewood, senior, is widely known in social and business circles of Manayunk, and has financial interests and institutions which claim his attention, although he has practically retired from the cares of business.

The Albion Dye & Bleach Works dye for the weaving and knitting mills of all sections of the country. Their city office is 132 Chestnut St., Philadelphia, with which the works are connected by telephone. With the exception of woolen yarns they invite correspondence on all kinds of dyeing and bleaching.

Cylinders and Dials.

We are pleased to direct attention to the card on page 169, of S. A. Ashman & Son, Philadelphia, the widely known manufacturers of cylinders, dials, and forgings for knitting machinery. No man is better known than Mr. Ashman in the production of his specialty, and no goods enjoy a higher reputation. As a veteran blacksmith for the knitting trade, and an originator in his line, he commands a unique position.

His son, who has for several years been a valued assistant, has been recently admitted to partnership, making the present style of the firm S. A. Ashman & Son. Mr. Ashman, Jr., is a chip of the old block, and is thoroughly up to the needs of his customers.

Self-Oiling Hangers.

The Fairmount Machine Co., of Philadelphia find that their adjustable self-oiling hanger is proving very popular in textile mills. It is surprising when such labor-saving devices as this are available to manufacturers, that there are so many mills that continue to use old style bearings, that require oiling every day. With these bearings, the oil reservoirs are filled once in six months, and that is all the attention they need, although many mills using them oil but once in twelve months. The oil delivered by the feeders in excess of consumption is thrown off by the shaft into a recess at each end of the bearing, and passes back into the reservoir. The actual cost of oiling in a large cotton and woolen mill where the bearings were fitted in this way proved to be 11½ cents for each bearing, for a period of eighteen months. This included labor, oil, and renewing of the feeders when required. There are probably comparatively few mills that figure the cost of oiling down to such a fine point as this, but if those using the old style were to figure it, it would doubtless be found that the difference in cost would pay for the self-oiling bearings.

MILL NEWS.

Cotton.

New Mills.

—Alabama, Thomasville. Regarding the report of the new cotton mill at this place, H. M. Mathis informs us that the company will be known as the Magnolia Mfg. Co., and that cotton yarns and cloth, brick, cotton seed oil, and cotton seed meal will be produced. The company is not yet organized, but he states that they have the necessary capital for a start, and organization will be perfected and work commenced within the next sixty days. Organization is to be on the modified co-operative plan. 6,000 to 10,000 spindles will be installed. Capital is $150,000. No contracts have yet been placed.

—*Kentucky, Paducah. The Cohankus Mfg. Co., of Hohokus, N. J., will build a cotton mill at this place, 80 x 248, two wings 42 x 112, brick, two stories, mill construction. Plans are by architects Samuel Hanaford's Sons, Cincinnati.

—North Carolina, Bessemer City. Pinchback & Smith of this place are said to be interested in a proposed mill to manufacture carpet warps. It is thought that about a 10,000 spindle mill will be built.

—North Carolina, Carthage. It is reported that the new cotton mill which has been talked of for some time, will now go ahead. B. H. Tyson and W. H. McNeill are said to be interested.

—North Carolina, No. Wilkesboro. A report is current that G. W. Hinshaw and W. F. Trogdon are endeavoring to establish a cotton mill at this place.

—*South Carolina, Augusta. E. F. Verdery, president and treasurer of the new Warren Mfg. Co., informs us that their new mill will not be in operation before April, 1898. The capacity will be 30,000 spindles, 950 looms. He states that it is proposed for the present to put in only 15,000 spindles. The original design contemplates a twin mill of the same size and similar arrangements as the first. Nothing further will be done on the second mill until the first is fully in operation. This company

has a capital stock of $200,000. Print cloths will be made. The mill is located at Warrenville, S. C., 10 miles northeast of Augusta.

—*Tennessee, Elizabethton. A new company ,with authorized capital of $100,000, has been organized here, to be known as the Tennessee Cotton Mills. The following officers have been elected: president, L. A. Briggs, Ashaway, R. I.; vice president, L. Godfrey, Providence, R. I.; secretary and treasurer, L. Hill, Ashaway, R. I.; general manager, M. E. Clark, Elizabethton, Tenn. It is stated that ground will at once be broken for a fireproof brick building, 150x50 feet, with boiler house 30x60, and that machinery will be in operation before January 1st, making cotton yarns from 10s to 20s. We understand that this mill will make yarn for the Tennessee Line & Twine Co., of which M. E. Clark is also general manager.

—*Texas, Lodi. W. H. Erambert writes us that $12,000 has been subscribed for the capital stock of the proposed new cotton mill here. $50,000 is the amount to be raised. He states that he has not canvassed yet in the interests of the company, and he expects that stock will be taken up and a company organized soon. W. C. Jones and S. Hooper are also interested in this new enterprise.

—Texas, Corsicana. A subscription list is being circulated at this place to raise capital for a cotton mill, shares to be $10 each. They will start with a small plant. The Farmers' Alliance is to act as trustee, and the committee in charge is as follows: R. A. High, James Garitty, J. G. Willis, C. H. Allyn, T. B. Roberts and James L. Autry.

Enlargements and Improvements.

—Connecticut, Grosvenordale. The Grosvenordale Mfg. Co. have put 8000 more spindles and 300 more looms in mill No. 1, and in mill No. 2, situated at N. Grosvenordale, they are putting in 24 new Whitin spinning frames, 10,000 spindles, and 136 looms. They are also breaking ground for a new cotton storehouse.

—*Georgia, Cedartown. The Cedartown Cotton Mfg. Co. inform us that it is their intention to treble their present plant, which will give employment to about 240 more operatives. The enlargement will provide for 7,500 new spindles, making a total of 11,000 spindles and 27 sets of cotton cards. They will run on hosiery and underwear yarns, 10s to 24s. Charles Adamson is president, Thomas Adamson, treasurer. W. Parker is vice-president and manager. Most of the machinery has been contracted for.

—Georgia, Dalton. The Crown Cotton Mills will shortly double the capacity of their plant, and will build a large warehouse at once. At their annual meeting Sept. 15, a 25 per cent. dividend was declared.

—*Georgia, Whitehall. The Georgia Manufacturing Co. confirm our report of September 17, that they are to operate their plant by electricity, and expect to have the same in operation January 1, 1898. They will add 3328 spindles, giving them a total of 11,656. John R. White is president and treasurer.

—Massachusetts, Lancaster. The Lancaster Mfg. Co. is to build a two-story brick structure, to cost about $20,000. This will give employment to about 50 more operatives. The mills have been very busy during the last few months.

—Masssachusetts, North Adams. A report states that the Windsor Print Works Co. have prepared plans for a large brick finishing room, 90 x 60 feet, and a large storage warehouse, 200 x 60 feet. These are being erected owing to the increased business of the company.

—New Hampshire, East Jaffrey. N. D. White & Sons propose to build an extensive addition to their mill, 125 x 50, 4 stories, and another building 100 x 38, two stories, both of brick. The plans of Cutting & Bardwell, Worcester, will be used. The buildings will cost about $50,000.

—New Hampshire, Nashua. The Jackson Co. have started work on a new mill, to replace their mill No. 2, an old structure built in 1826. The old mill will be torn down, and a new building will have double the capacity of the old, giving room for 255 looms.

—New Jersey, Millville. In reference to our report of Sept. 17 that the Millville Mfg. Co., which had recently started, was to build an addition, J. K. Russell, general manager, writes us that the company has no intention of making any addition at present.

—North Carolina, Cherryville. The Gaston Cotton Mills will probably add 1500 spindles and 100 looms, within a few months. It is stated that Whitin machinery will be bought. The mills are running night and day.

—North Carolina, China Grove. The Paterson Manufacturing Co. have placed orders for some new Whitin spinning frames for the hosiery yarn mills and will soon have 4,000 additional spindles in operation. This company has recently erected buildings to be used as packing and warehouse rooms and dwellings for the operatives.

—*North Carolina, Fayetteville. The Hope Mills Mfg. Co. write that they expect to occupy their new addition about December 1st. 60 looms will be put in, making a total of 460 looms and 15,000 cotton spindles. They will run on cheviots. President, W. C. Houston, Jr.; Nicholas Fennig, treasurer; S. H. Cotton, secretary and manager.

—North Carolina, Forest City. The Florence Mills, which were recently purchased by the Henrietta Mills of Henrietta, N. C., are being enlarged, and 12,000 new spindles and 400 looms will be put in.

—Pennsylvania, Chester. The Chester Mfg. Co. will build a large addition to their mill at Green & Caldwell Sts. It will be 50x110, and will accommodate 60 additional looms. Dennis Howarth is president of the company.

—*Pennsylvania, Easton. Charles Chipman's Sons write us regarding their purchase of the Matteawan Valley Co. building, that they will add a one story building 109x124, and expect to start running April 1, 1898, employing 100 more operatives on cotton hosiery yarn. This plant will consist of 12 sets of cards, and 4,000 mule spindles. Work on the new building will start Oct. 15.

—Pennsylvania, Philadelphia. The Ontario Spinning Co., 1729 Phillips St., have put in new picking machinery, also new

Platt cards. They are now making first-class white hosiery yarn, instead of colored hosiery yarn, as heretofore. Wm. T. Westerman is manager.

—South Carolina, Anderson. Work is now in progres on the erection of a large addition by the Anderson Cotton Mills Co. and it will soon be ready for the machinery. Nearly 20,000 will be added to the capacity of the plant. Gen. Manager R. E. Ligon states that when the new building is equipped the complete plant will contain 36,000 spindles and 1,200 looms. The capital stock of the company is now $500,000, having been recently doubled.

—*South Carolina, Bath. It is reported that the Aiken Mfg. Co., will build a new mill, known as Mill No. 2. This will be in addition to the improvements which are now being made, that is, the installation of 312 looms and 44 spinning frames. It is expected that two of the stockholders will furnish capital for this new mill.

—South Carolina, Clifton. The Clifton Cotton Mills Co. will replace some of their old machinery with new in the three mills, Nos. 1, 2 and 3. About 50 new Lowell looms have already been ordered for Mill No. 2.

—South Carolina, Fingerville. The Fingerville Mfg. Co. is reported as planning an enlargement and an increase of capacity of 50 to 75 per cent. next year. President, J. B. Lillies.

—*South Carolina, Orangeburg. The Enterprise Cotton Mills, which are to install new machinery, will increase their capital stock from $75,000 to $100,000.

Mills Starting Up.

—*Alabama, Selma. The Matthews Cotton Mill property was sold October 8th for $70,200 to Dr. O. F. Cawthorn of Mobile, and Dr. A. W. Cawthorn and O. M. Cawthorn of Selma. Dr. O. F. Cawthorn is president and treasurer of the Stonewall cotton mills, Stonewall Station, Miss. They announce that the Matthews mills will be put in operation soon and run to their full capacity, requiring 350 hands.

—Connecticut, East Killingly. The Mashentuck Cotton Co. of this place has started up its mills, after a long shut down.

—Connecticut, Versailles. It is reported that preliminary papers have been signed for the sale of the Versailles mill property to the Uncasville Cotton Co., of Uncasville, Ct. The town of Sprague has agreed to make concessions to the Uncesville Co. in the matter of relief from taxation. At present there are 25 men at work on the Versailles plant, getting it ready for operation, which is expected to begin within two months.

—Connecticut, Voluntown. The Griswold Cotton Mill Co., which has been shut down since August 1896, will start up October 15 in full, operating 280 looms. The Briggs Manufacturing Co. are now running their three mills on full time.

—Delaware, Newcastle. The Triton Cotton Mills, owned and formerly operated by James G. Shaw, will start up shortly. Mr. Shaw with others is also starting up the Eastlake Woolen Mills, at Bridgeton, N. J., under the name of the Bridgeton Woolen Co.

—*North Carolina, Huntersville. The Anchor Mills is the name of the new corporation which will operate the Virgin cotton mill, which we reported recently had been bought by W. E. Holt, C. W. Johnson and J. S. Spencer. Cotton yarn will be made. Capital stock is $50,000.

—North Carolina, Randleman. The Marie Antoinette mills at this place, which were built about two years ago, but have never operated, will probably be started up on colored goods. The mill contains 80 looms.

—Pennsylvania, Philadelphia. The Dingley Mfg. Co. has leased the mill at 31st and Read Sts., which has been idle for two years, and has started up with about 50 hands. This mill is owned by George Campbell & Co., who operate the Continental Worsted Mills.

—South Carolina, Central. The new mill of the Norris Cotton Mills Company is expected to start November 1.

—*South Carolina, Spartanburg. The Arkwright Mills, R. Z. Coates, president, have been started up, although all the machinery is not yet in motion.

—Texas, Cuero. It is stated that efforts are being made to start up the Excelsior Manufacturing Co., which has been idle for a long time.

—Virginia, Richmond. The Marshall Cotton Mills, which have been idle for several months, were started Oct. 4 with about 100 operatives. A larger force will be employed when the river is higher, and furnishes more power.

Woolen.

New Mills

—*Kansas, Topeka. The new woolen mill under the management of J. F. McAfee, will now be pushed forward at once. The Commercial Club has secured a large amount of orders for the product of the mill from local parties. The machinery will be at once brought from the old woolen mill at Independence, Mo., and set up in the building at Oakland.

—*Massachusetts, Blackstone. The sale of an undivided half of the Waterford Mills estate was to take place October 15, to satisfy a mortgage now held by the Delebarre heirs, for about $60,000. It was understood that this half of the mill will be bought by Charles Fletcher, who will probably purchase the entire property. One of the Delebarre heirs objected to the sale however, and it is not known what further action will be taken.

—Michigan, Sault Ste. Marie. It is reported that G. J. Griffith of Griffith & Walz, proprietors of the roller flour mill at Pickford, is to establish a woolen mill at this place, and that he has purchased machinery, leased a site, and is now waiting for the city to grant him a free water privilege, and exemption from taxation for a number of years. He hopes to have the mill in operation about Jan. 1.

—*Pennsylvania, Hulmeville. Plans for the new mill of F. Rumpf & Sons, of Philadelphia, are being prepared by architects J. F. Stuckert & Sons, 49 No. 13th St., Philadelphia, the cost of the building including all sub-contracts not to exceed $38,000.

—*Pennsylvania, Philadelphia. Thomas Boggs has let the general contract for his new carpet factory at the N. E. corner 2nd St. & Allegheny Ave. to Wm. Steele & Son, 506 Walnut St. The factory will be built on the latest principles of slow burning construction, of brick and iron, with terra cotta trimmings, and will cost about $70,000.

—Pennsylvania, Scranton. It is stated that W. J. L. Brock of Huddersfield, Eng., wants to locate a mill, to make fine worsteds, at this place. John Ross, a former resident of Scranton, is also said to be interested in the project, and both gentlemen have been here recently looking over the ground.

—Rhode Island, Olneyville. Ground has been broken for the new Earncliffe mill to be built here. The proprietors are Walter A. Guile and Herman Waterhouse. Mr. Guile has been wool buyer for the Riverside Mills, and Mr. Waterhouse was a designer at the same mill. Fine worsted goods will be made, and about 200 hands employed. The main building will be 180 x 60, brick. It is expected that the mill will be finished and ready for the machinery by Dec. 4th. George Leach is architect.

—Rhode Island, Olneyville. Leander W. Peckham will build a new mill at this place, 60x40, two stories, wood. His present mills are now running night and day.

—Tennessee, Nashville. It is reported that Womack & Son have purchased a 16-loom mill, have bought woolen machinery, and will put the plant in operation soon.

Enlargements and Improvements.

—Maine, Fairfield. The Kennebec Worsted Co. will put in 28 looms, and will do their own weaving.

—Maine, Newport. The Newport Woolen Co. have had work started on a $12,000 addition to the mill by contractors Levi Busiel & Son of Waterville. This will be ready for the machinery about the middle of December.

—*Maine, Pittsfield. Robert Dobson & Co. write us that they have not fully decided to build an addition to their plant this fall, and that when built it will not increase their production, but is simply to accommodate some of their present machinery, which is somewhat crowded.

—Maine, Wilton. F. J. Goodspeed proprietor of the Wilton Woolen Mills has the foundation laid for an addition to the mill. Work will progress rapidly.

—Massachusetts, Caryville. Messrs. Taft, Murdock & Co. have started the erection of a two-story brick building, 120 x 26 feet, the first story will be used as a picker room, and the upper for looms.

—Massachusetts, Haverhill. Stevens and Company will build an additional story to their woolen mill No. 2, to give them increased capacity.

—*Massachusetts, Lowell. The Lowell Mfg. Co. will have a new two-story weave shed built on its land abutting Market St., the addition to be run on Axminster carpets.

—*Massachusetts, No. Andover. The Brightwood Manufacturing Co., started work September 27 on an addition to their mill, which they expect to complete by December 1. This will give employment to ten more operatives, and give them a total of 44 looms, making fine worsted and novelty dress goods. G. E. Foss, Jr., is president; George H. Simonds, treasurer; and F. Ertinghausen, superintendent. This is a confirmation of our report last month.

—*New York, Lestershire. The Faats Brush and Felting Co., writes us regarding their additions that they will build one four-story stone building 44 x 100 feet, to be used entirely for the making of felts. They will also build one three-story stone store-house, 42 x 80 feet and a large boiler house to contain two boilers, 250 h. p. The basement of the storehouse will be used entirely for the storage of water, a capacity of about 150,000 gallons. This reservoir will be used entirely for fire protection, in connection with the Grinnell Automatic sprinklers. Eight sets of cards will be operated, and they expect to have all of the improvements completed and in full operation by the first of December.

—North Carolina, Elkin. The Chatham Mfg. Co., who are making a fine line of blankets, will enlarge its capacity soon. This is a three-set mill.

—*Pennsylvania, Bristol. The Bristol Council has decided to reduce the width of Jefferson Ave., which will allow Wm. H. Grundy & Co., worsted yarns, to build their proposed addition. It is reported that this building will cost $75,000., and will be 350 feet long, and one or two stories high.

—Pennsylvania, Darby. Verlenden Bros. will start work at once on the large addition to their plant here, the Imperial mill. Plans were made and foundation laid for this addition in 1892, but the work was stopped, owing to poor business. The addition will be 90x60 feet, three stories, brick.

—*Pennsylvania, Philadelphia. Hirst & Roger, manufacturer of carpets, Kensington Ave. & Huntington Sts., confirm the report that they have purchased a large mill at Allegheny & Kensington Aves.

—Pennsylvania, Philadelphia. M. D. McDonald & Co., proprietors of the Castle Bank Mills, started up about the 1st of September, after a shut down of nearly four years, on cassimeres, cloakings and suitings. They are now employing 50 hands, but expect to put in new machinery, to employ about 150 more operatives.

—*Pennsylvania, Philadelphia. Joseph H. Bromley is to build an addition to his carpet factory at 4th St. & Lehigh Ave. from plans of Hales & Ballinger. We recently reported that John Bromley & Sons, Lehigh Ave., below Front St., were to make this addition, but we find that we were mistaken.

Mills Starting Up.

—Connecticut, East Killingly. Chase Bros., of Elmville, Ct., have bought the Himes cotton mill here, and will immediately fit it up for the manufacture of woolen goods.

—Connecticut, New London. R. M. Lane, treasurer of the New London Steam Woolen Mill, confirms the report that the mills will start up immediately. No additions or changes will be made in the plant.

—Connecticut, Putnam. The Putnam Woolen Co. has started up its mill No. 1, after an idleness of about a year. It is expected the entire plant will be running full time soon.

—Maine, Turner. F. T. Faulkner will start up his woolen mill soon on flannels and blankets.

—Massachusetts, Millbury. The Lapham Worsted Mill, recently purchased by E. B. Mayo and Thomas C. Curtis, has started up within a few days, with J. R. Greenwood of Dexter, Me., as superintendent. The company will be known as the Mayo Woolen Co., capital stock $100,000.

—Massachusetts, Spencer. The middle mill of the Valley Mills plant will be started up within a month by C. N. Prouty and N. M. Darling. This is a three set mill, with 17 broad looms, and will give employment to 40 or 50 hands.

—New Hampshire, Tilton. It is reported that Mr. Hart, of Hart, McArthur & Hart, has bought the old mill formerly operated by George E. Buell, which has been closed and for sale for some time. It is expected that Mr. Hart will start up the mill on woolen cloth soon.

—*New Jersey, Bridgeton. The Bridgeton Mills Co., of which Mr. Shaw, a former owner of the East Lake Woolen Mills, is still a member, is getting the plant in readiness to start as soon as possible.

—New Jersey, Plainfield. The Van Deventer Carpet Co. resumed work in its factory on South Ave. recently, after a shut down of four weeks. S. J. Acheson, superintendent, has nearly 60 hands employed, and orders are in hand to keep running until December 15th.

—New York, Dansville. The woolen mill, situated on Mill Creek south of this town, which has been closed for several years, is soon to be started up. It is owned by John Hyland. Some new machinery will be added, and general repairs made, a new dam and iron flume constructed. The mill was formerly operated by Stewart & Phillips, and at the time it was closed down, the firm was Stewart & Johnson.

—Pennsylvania, Philadelphia. The Lincoln Mills at Manayunk, which have been idle for the past seven years, have been purchased from the estate of the late David Wallace, by Sylvester Taylor, who, it is stated, will put them in operation.

Knit.

New Mills.

—California, Cloverdale. It is reported that L. Walker proposes to start a hosiery factory at this place.

—*Connecticut, Somers. J. E. Fenner of Hopevale, Ct., manager of the Hebron Knitting Co. at Turnersville, Ct., who recently purchased the Kenworthy woolen yarn mill at Somers, will shortly remove the knitting machinery from the Hebron mill, and fit up this plant for a hosiery mill. He intends putting in enough knitting machinery to use the entire production of the mill of woolen and merino yarns.

—*Indiana, Fort Wayne. It is now reported that Mr. Fred Thieme has decided to start a knitting mill here, the effort to organize a stock company having failed. Mr. Thieme is said to have ordered knitting machines from Germany. Children's and misses' hose will be made. The site for the new factory has not been decided upon. About 30 operatives will be employed at the start.

—Massachusetts, Highlandville. It is reported that John F. Brooks & Co. have purchased of Samuel Hudson land on Hunnewell St., and will erect a new knitting mill.

—New Jersey, South Dennis. There is a report current here that Warren Mitchell, of Philadelphia, will establish a hosiery factory at this place.

—*New York, Athens. The new knitting mill here, to be operated by the Athens Knitting Co., Frederick Jessup president; F. J. Sagendorph treasurer; John Maginnis superintendent, expect to have the plant in operation January 1st. The building will be 55 x 160, two stories. Will employ 100 operatives, on 4 sets woolen cards, 30 knitting machines. Will run on knit underwear.

—New York, Buffalo. Miss Annie Winter, 5 E. Genesee St., is contemplating the manufacture of ladies' hose and underwear, either on hand machines or possibly by power.

—*New York, Little Falls. The Elboeuf Knitting Co., of which H. G. Babcock and John B. Morgan are proprietors, will start up its new plant November 1st, employing 15 hands. They will make sweaters, golf hose, and high grade sporting goods. Electric power will be used, and 12 knitting machines installed.

—New York, Warrensburg. We note a report that a firm of knit goods manufacturers, employing about 50 hands, is negotiating with Hon. L. W. Emerson in regard to locating in the new part of the Whitby & Co.'s woolen mill.

—*Pennsylvania, Newville. Regarding the report that the Newville Knitting Mills are to establish a branch at Mansfield, O., W. C. Woodburn, manager of the company, informs us that this matter is not yet decided. They have increased their plant at Newville by the addition of a building 50 x 50, accommodating 88 machines, making their output 1,000 dozen per day.

—Pennsylvania, Norristown. Lewis E. Tanbel, proprietor of the Star Hosiery Mills, has just added a hosiery mill to his plant, formerly a dye house, and intends manufacturing seamless hosiery. He has 32 knitting machines. Harry McMullen, 235 Market St., Philadelphia, is selling agent.

—Pennsylvania, Perkasie. A new knitting mill is being erected by local parties, in which H. A. Moyer, Grier Scheetz and Mahlon Keller are interested. Production will begin about Dec. 1, employing 50 hands.

—Pennsylvania, Philadelphia. The Charmwood Hosiery Mills is a new concern recently incorporated to manufacture full fashioned half-hose. They will occupy the building at the corner of Lehigh Avenue and Mascher Street.

—Pennsylvania, Reading. Jackson De Hart and William De Hart will engage in the manufacture of stockings in the building, fomerly occupied as a straw hat factory at 2nd & Buttonwood Sts. New machinery is expected to arrive soon, and the plant started up with about 50 hands.

—Vermont, Lyndonville. A local concern has been organized here with about $20,000 capital, to be known as the Lyndonville Knitting Manufacturing Co. They will rent power from the town.

—*Wisconsin, Stevens' Point. H. S. Blake & Co., proprietors of the Racine Knitting Co., Racine, Wis., confirm the report that they will build a branch at Stevens' Point. A new building will be constructed 40 x 100, one story, brick, to be occupied December 15. 40 to 45 operatives will be employed on a line of ladies' cotton and merino hose, double sole, high spliced heel. 40 knitting machines will be put in.

Enlargements and Improvements.

—*Indiana, Fort Wayne. The contract for the erection of the addition to the Wayne Knitting Mills has been let to John Suelzer, the carpenter work to cost $6000. The entire improvements will cost about $12,000, building to be completed on December 1. The main structure will be 50x200 feet.

—New York, Oswego. Frederic Conde, manufacturer of knitted specialties, has decided to enlarge his plant. Plans have been prepared by Architect S. E. Loring of Syracuse, which call for a new structure in the rear of the present factory 40x60, three stories. This addition will give employment to 150 hands.

—Pennsylvania, Reading. It is reported that Lewis Weber & Co., hosiery manufacturers at 126 Orange St., have purchased a lot 25x115, adjoining their mill, and that they will build an addition to their plant.

Mills Starting Up.

—New Hampshire, Scytheville. The Murphy Hosiery Co., John Murphy, president and manager, which has been idle for some time, is reported as about to start up.

—New Jersey, Nutley. The Underhill Mfg. Co., manufacturers of men's and children's underwear, have started up, after a shut down of some months.

—*New York, Cohoes. The Parsons Mfg. Co., which has moved into the Standard mill, will start up about January 1st, with six sets of cards.

—*New York, Waterford. The knitting mill, formerly operated by the Hudson Valley Co., and recently reorganized as the Clover Knitting Co., will be started up very soon, with John Donahue as superintendent.

—Pennsylvania, Elizabethville. The Enterprise Hosiery Co. will start up before November 1st. They have bought the latest improved automatic machines, and will make a fine grade of ladies' hosiery. I. T. Buffington is president; C. W. Enders, treasurer.

—Pennsylvania, Hollidaysburg. It is stated that Zeiber, Herbine & Co., of Reading, Pa., have bought the Enterprise Hosiery Mill at this place, formerly operated by Libby & Co., and that the plant, which has been idle for a year, will now be started up.

—Virginia, Newport News. The Newport News knitting mill, Godwin & Stewart, proprietors, have started up, after an idleness of nearly twelve months. They make ribbed underwear.

Fires.

—Michigan, Alma. The woolen mill of H. W. Moore was destroyed by fire Oct. 1. This was a one set mill, and the loss is estimated at about $5,000. No insurance.

—New York, Mellenville. The Wellington Knitting Mill, operated by J. A. Pulver, was damaged by fire September 24, to the extent of $7,000. The fire started in the card room. It is stated that it will be about six weeks before the plant is able to start up.

—New York, Troy. The Commercial Knitting Mill sustained a loss September 16 of about $3500. Five carding machines were damaged.

—Ohio, Cincinnati. The cotton mill of P. R. Mitchell & Co., 1915 Queen City Ave., was damaged to the extent of $10,000. on Sept. 15. The fire started in the picker room.

Facts and Gossip.

—Connecticut, Killingly. The Yukon Woolen Company, which started up its plant July 1, are running full time. This plant was leased to Wm. Sayles, and is making a good line of kerseys. The past four weeks they have been running their carding and spinning from 4 a. m. to 10 p. m., and they are now running the departments over time.

—Connecticut, Stafford Springs. The Stafford Worsted Co. has been incorporated, with capital stock of $50,000., to operate the worsted part of the plant, formerly run by the Warren Woolen Co. at this place.

—Georgia, Athens. J. H. Dootson has resigned as president of the Athens Knitting Mill, and sold his interest to Lewis Camak, who has been elected president. Mr. Dootson is manager of the Athens Mfg. Co. He is doing a successful business.

—Illinois, Aurora. The Aurora Bleachery & Dye Works, which up to the present time have done only bleaching, now intend building an addition for dyeing. The building will be 52 x 32 feet.

—*Massachusetts, Methuen. John W. Jowett has purchased the yarn mill of Wendell Bros., and will operate same here, Wendell Bros. will move to Meredith, N. H. Oct. 1, we reported that Mr. Jowett would operate the Meredith plant, but we find this was a mistake.

—Massachusetts, New Bedford. There was a rumor recently that the Oneka Mill would be started up Nov. 1, but president Loum Snow states that the plant is for sale, and that the company will not start it again.

—Massachusetts, Warren. Sayles & Jenckes have notified their employees that on and after Oct. 30 their wages will be increased 5 per cent. The mills have been through the recent depression at 10 per cent. reduction, up to last May, when 5 per cent. was advanced, so that this last increase will restore the old rate.

—New York, Cohoes. The Globe Mill No. 2 was recently sold to Frederick K. Kavanaugh, to satisfy the mortgage of $12,000 held by Arthur J. Case, of Saratoga Springs. The mill was recently

started up under the management of George W. Kavanaugh, and the operation of the mill will not be interfered with by this sale.

—New York, Jamestown. The Empire Worsted Mills, which have recently made a large addition to their plant, have decided to increase the capital stock from $100,000 to $250,000, the new stock to be taken by the present stockholders.

—*New York, Mechanicville. The Tenendaho Knitting Mill property was sold recently on mortgage foreclosure proceedings to W. B. Neilson of Mechanicville, who, with Howard Neilson, Henry B. Newland and H. Westervelt previously owned the property. It is rumored that W. H. Rowe of Troy will start up the plant soon.

—New York, Mechanicville. The old Hagar knitting mill recently purchased by M. McCauley is running full time.

—New York, Waterloo. The Waterloo Knitting Co. has taken up the making of a line of specialties, in place of full unwear, as heretofore.

—New York, Watcrford. A new company was organized Sept. 30, to be known as the Clover Knitting Co., and will succeed the Hudson Valley Co. The officers were elected as follows: Peter McCarthy, Troy, president; Thomas Breslin, Waterford, vice-president; J. H. Pynes, Waterford, treasurer; Robert Stover, secretary. Capital, $60,000.

—*North Carolina, Huntersville. W. E. Holt, J. S. Spencer and C. W. Johnson of Charlotte, N. C. have purchased the Virgin Cotton Mill at this place, and it is reported that they will remodel same to spin yarn.

—*Pennsylvania, Chester. The plant of the Lilley & Sons Mfg. Co. was sold last month by the sheriff to W. B. Broomall for about $5,500. It is thought that the mills will be started up before long.

—Rhode Island, Bristol. The Cranston Worsted Mills are now running until ten o'clock every night, to keep up with their orders.

—Rhode Island, Olneyville. The National & Providence Worsted Mills, of which Charles Fletcher is president, announced to their 4,000 operatives that an increase of wages, to restore the schedule of 1893, will take place December 1st. It is probable that all the mills in Olneyville and vicinity will make a similar advance in wages.

—Wisconsin, Albany. We understand that the Albany Linen Mill, operated by A. D. Fleming & Co., has been purchased by M. V. Nichols and C. H. Arsdale of Beatrice, Neb., for $57,000. The plant will be put in good order, and run at its fullest capacity, which is 4,000 yards a day, employing 75 hands.

—The Holbrook Mfg. Co. of New York have opened a branch office at room 439 Bourse Building, which is in charge of Mr. R. D. Kirkland, well known to the textile trade in that vicinity. The Holbrook Co. have always done a large business in the Pennsylvania district, and this office will bring them into still closer touch with the trade in that vicinity.

PERSONAL RECORD.

Cotton.

Alf Barnes has severed his connection with the Dixie Mills, of LaGrange, Ga. He held the position of superintendent.

R. A. Mitchell has been appointed overseer of carding by the China Manufacturing Co., Suncook, N. H.

Leonard Wilkinson, formerly an overseer in the weaving department at the Albion Co.'s mill at Valley Falls, R. I., is now overseer at Williamstown, Mass.

T. F. Maguire, formerly at Providence, is now with the Albion Co., Albion, R. I.

—L. H. Brown has accepted a position as overseer of weaving at Saundersville, Mass. He has been for several years section hand in the weaving department of the Lancaster Mills, Clinton, Mass.

—Henry Glover is to succeed Benjamin Kirk as superintendent of the Shove Mills corporation at Fall River.

—Charles C. Diman has resigned his position as agent of the Whitman Mills, New Bedford, Mass., and is confined to his house by illness.

—B. J. Dobbins, is overseer of carding at the Arcade Cotton Mills, Rock Hill, S. C. He was formerly in the carding room of the Laurens Cotton Mills, Laurens, S. C.

—Thomas Linnehan has resigned his position as overseer of mule spinning at the Shove Mills, Fall River, Mass., where he has been for eight years

—Thomas Brindle, formerly with the Boston Mfg. Co. as second hand, now with the Hope Webbing Co., Providence, R. I. as overseer of weaving, dress leno trimmings, elastic web and shoe web, etc. has engaged John H. Dutting, formerly with the Springfield Narrow Fabric Co. as second hand, as business is rushing.

—George Layfield has taken a position as boss spinner at the Adams Mill at Montgomery, Ala.

—Joseph D. Williford has taken charge of the spinning, quilling, warping and spooling at the Lakeside Mills, Burlington, N. C., having resigned his position as overseer of carding and spinning at the Hiawatha Cotton Mills, Gibsonville, N. C.

—The many friends of W. H. Cotton, now superintendent with Wm. Parks & Son, St. John, N. B., will regret to learn of the death of his young daughter. His boy has also been quite ill, but has now recovered.

—J. A. Parker has taken charge of the card room in the Toccoa Cotton Mills, Toccoa, Ga., formerly second hand at the Louise Mills, Charlotte, N. C.

—Wm Cameron is dyer with the Fort Mill Mfg. Co., Fort Mill, S. C.

—W. S. Harbin is superintendent of the cotton mill at Hartwell, Ga.

—George Jordan has taken his former position as overseer of spinning at the cotton mill at Allendale, R. I.

—E. E. Clark is temporarily superintendent of the North Webster mill. He was formerly superintendent at the Slater mill, Wilkinsonville, Mass.

—J. W. Roberts has resigned as superintendent of the Norris Cotton Mills, Central, S. C., and taken the position of overseer of spinning with the Courtenay Mfg. Co., Newry, S. C.

—T. G. Johnson, overseer carding and spinning at the Asheville Cotton Mills, Asheville, N. C. has taken a similar position with the Clinton Cotton Mill, Clinton, S. C. On leaving, he was presented with a silk umbrella, collar and cuff buttons by the help.

—J. R. Pierce is to succeed J. T. Jackson as superintendent of the Jackson Cotton Mills, Reidsville, N. C. Nov 1st. Mr. Pierce has been superintendent of the Fulton Bag & Cotton Mills, Atlanta, Ga. for the past nine years.

—Archibald Cooper is now boss carder at the Shady Lea Mill, Woonsocket, R. I. He was recently with the Ballou Mills, Woonsocket.

—W. L. Smith has resigned his position as card grinder and second hand at Camden, S. C., and will take charge of the card room of the Mills Cotton Mills, Greenville, S. C.

—G. T. Brown has resigned his position as boss weaver at the Camden Mills, Camden, S. C. J. A. Booth will take his place.

—W. W. Peeler is boss dyer with the Naomi Falls Mfg. Co., Randleman, N. C. He was formerly with the Leaksville Cotton Mills, Spray, N. C.

—I. J. Dixon has taken a position as spinner at Beaumont, S. C. He has held a similar position with the Buffalo Thread Mills, Concord, N. C.

—Edward McKown has taken charge of the carding at the Charleston Cotton Mills, Charleston, S. C. He was formerly night superintendent at the Cherokee Falls Mills, Blacksburg, S. C.

—George W. Weeks, who was 19 years agent of the Lancaster Mills, Clinton, Mass., and who resigned over a year ago on account of ill health, has just returned from a tour of the world, greatly improved in health.

George Kluttz has accepted a position as superintendent of dyeing with the Salisbury Cotton Mills Co., Salisbury, N. C. He was formerly with the Randleman (N. C.) Mfg. Co.

—Charles Suttle, who has been spinner at the Lincoln Mills, Lincolnton, N. C. has taken charge of the spinning at the Victor Mills, Charlotte, N. C.

—A. M. Davis, formerly superintendent of the Columbia Cotton Mills, Columbia, S. C., has gone with the Utica Cotton Co., Capron, N. Y.

—J. T. Atherton is superintendent of the Woodstock Cotton Mill, Too Nigh, Ga.

—D. A. Kelly, formerly with the Cherryville Mfg. Co., Cherryville, N. C., has taken a position as overseer of spinning with the Lincoln Cotton Mills, Lincolnton, N. C.

—J. C. Clippard, who has been boss spinner at the Pelham Cotton Mills, Pelham, S. C. has gone to the Spartan Mill No. 2, Spartanburg, S. C., to take charge of 37,000 spindles.

—George D. Pryor, formerly second hand in No. 3 mill at Clifton, S. C. has gone to Glendale, S. C. to take charge of the spinning in the Converse mill.

—W. G. Trice has been made overseer of spinning in the Edna Cotton Mills, Reidsville, N. C.

—J. L. Turner has been appointed superintendent of the cotton mills at Taylorsville, N. C.

Woolen.

J. Maguire has resigned as boss carder with the Summit Woolen Mill, Staffordville, Ct., and has been succeeded by C. H. Howe of Oakland, Md. M. Sullivan is loom fixer at this mill. He was formerly at the Southwark Mill, Philadelphia.

John McManus has returned to his old position as boss carder for Franklin Glazier & Son, S. Glastonbury, Ct.

Fred Barker has resigned as superintendent of the worsted yarn department at the Sawyer Woolen Mills, Dover, N. H., to accept a position as superintendent of the Phenix Mills, 10th St. & Germantown Ave., Philadelphia.

Alexander Keith has returned to his former position with S. Greenwood & Son, Coatsville, Pa., which he held for 12 years, and resigned to accept a position as boss carder with James Roy & Son, of W. Troy, N. Y.

Arthur Stokes is now overseer of finishing at the Phenix Mills, E. Greenwich, R. I.

Willis F. Anthony, who has been in charge of weaving, dressing and designing for the Dews Woolen Co., N. Dexter, Me., during the past two years, recently resigned, and his operatives presented him with a silver water set and Masonic pin.

J. H. Mack, who has been with the Kent Woolen Co., of Centreville, R. I., for the past five years, having charge of weaving, has accepted a similar position with the Farwell Worsted Mills, of Central Falls.

Charles Naylor has recently been appointed boss finisher in the Racine Woolen Mills, at Racine, Wis.

Fred Morey is now boss weaver at the Danville Woolen Mills, Danville, Ill.

—Theodore N. Parent has taken a position as second hand in the card room of the Algonquin Co., Passaic, N. J. He was formerly with Theo. Oakes & Co., Bloomfield, N. J.

—John Fayhe has accepted the position of assistant superintendent of the James J. Regan Mills at Rockville, Ct. He was formerly with Samuel Fitch & Sons, same place.

—Frank Apelbee, who has been with F. L. Sayles & Co., Pascoag, R. I., has taken a position with W. A. Inman, Harrisville, R. I.

—S. Ball is boss spinner at N. Uxbridge, taking the place of the late J. A. Bowen.

—Luther J. Robertshaw, formerly with the Crabtree & Patchett worsted mills at Montgomery, N. Y., has accepted a similar position with the Phoenix Mills Co, Philadelphia.

—Wm Green has recently taken a position with the Griswold Worsted Mills of Darby, Pa

—Benjamin Barnett of Blackstone, Mass. has taken a position as wool buyer for the American Worsted Co., Woonsocket, R. I.

—John Walsh has been chosen general manager of the Franklin Woolen Mills Co., Franklin, Ky.

—Thomas Flynn has charge of the wool sorting in the Colchis mill at Woonsocket, R. I.

—Joseph Daly, who has been carder for the Pontoosuc Mfg. Co., Pittsfield, Mass., has taken a position with the Hawthorne Woolen Mill, Glenville, Ct.

—Charles North, formerly with the Standish Worsted Co., Plymouth, Mass., has taken a position as overseer finishing with the Hockanum Co., Rockville, Ct.

—John North, who was formerly overseer carding with the Springville Mfg. Co., Rockville, Ct., has taken a similar position with the New England Co., same place.

—Thomas J. North has been promoted from second hand to overseer carding in the mill of the Springville Mfg. Co., Rockville, Ct.

—F. A. Brown, Stafford, Ct. has taken a position as boss finisher for the Bridgeton Woolen Co., Bridgeton, N. J.

—John Thickens, son of John C. Thickins, supt. Wm. E. Tillotson's woolen mill, Pittsfield, Mass., and also John E. Foster, son of one of the proprietors of the Newburg Woolen Mills, Newburgh, N. Y., have entered this year's class at the Philadelphia Textile School.

—Wm. Hendry has been promoted to the position formerly held by the late James B. Lyall as overseer of the dressing room of the Lower Pacific Mills. Mr. Hendry was formerly in the slashing and spooling room.

—James McDowell, formerly boss dyer at H. A. Kimball's mill, Manton, R. I., has accepted a similar position in Rockville, Ct.

—W. L. Mabbett has been engaged by Amos Abbott & Co., Dexter, Me. to take the position made vacant by the death of H. W. Randall, boss dyer. Mr. Mabbett has recently been dyer at the Dexter Woolen Mills.

—Thomas Hartley has been engaged as overseer of spinning in George C. Moore's woolen mill at North Chelmsford, Mass.

—Arnold S. Welch has resigned his position with the Hamilton Mills, where he has been for 27 years.

—The following have resigned their positions at the Old Kentucky Woolen Mills, Louisville, Ky. H. Whitehouse, boss weaver; R. B. Lewis boss carder; John Haslam, dyer.

—Wm. Knox, formerly of Bridgton, Me., has accepted a position as carder for the Vassalboro Woolen Co., at North Vassalboro, Me.

—Atack Musgrove, formerly at West Eaton, N. Y., has taken a position as dyer at West Conshohocken, Pa.

—Thomas Hewitt has resigned his position as boss carder at the New England Mill, Rockville, Ct.

—Alfred Stokes is now overseer of weaving in Farwell's mills in Central Falls, R. I. He was formerly loom fixer in the Wanskuck, Mill, Providence, R. I.

—James Dawson of Dexter, Me., has been engaged as superintendent of the woolen mill of Newton Darling at Spencer, Mass.

—William Reimuth has taken a position as spinner in Glazier's mill, S. Glastonbury, Ct., having resigned his position with the Hockanum mill, Rockville, Ct.

—Edward Carney has taken a position as boss carder in a mill at Bennington, Vt., having resigned at the Leeds Mill, Rockville, Ct.

—George Williams has resigned his position as boss carder with the Greenville Worsted Mills, Greenville, R. I., and his place is taken by a Mr. Tucker, from East Greenwich, R. I.

—Allen S. Foulds, Lawrence, Mass. has taken a position as dresser in Kunhardt's mill.

—C. L. Whalley has resigned his position with the Beoli Co., and has taken a position as assistant designer for the Vassalboro Mills, Vasselboro, Me.

—S. Foster Sheldon is now overseer of weaving and dressing at the Reynolds Mfg. Co., Davisville, R. I.

—Sam Driver, one of the best known carders in New England, has recently taken a position at Bridgton, Me.

Knit.

—Robert Stairs of Amsterdam has been engaged as overseer of carding by L. E. Harrower, Hagaman's Mills, N. Y.

—S. E. Wray is superintendent of the recently established hosiery factory at Maxey's, Ga., that of the Maxey Mfg. Co.

—John M. McGinnis has resigned his position as superintendent of the Harder Knitting Co., Hudson, N. Y. He is interested in the erection of a new mill in Athens, of which plant he will be manager when completed. On leaving, he was presented by the employees of the mill with a handsome diamond stud and silver fountain pen, as an appreciation of the many courtesies extended to them during his connection with the mill.

Miscellaneous.

—W. A. Stone has resigned his position as superintendent of the bleachery at Concord, N. C., and has been succeeded by Thomas Kirkman of Williamstown, Mass.

—John Willis has resigned his position with the Southbridge Printing Co., Southbridge, Mass., and engaged with the Jewett City, Ct. bleachery.

—William W. Crosby of Woburn, Mass. has been engaged as professor of mechanics in the Lowell Textile School.

Deaths.

—Samnel Whitescott died Oct. 3d at his home in Uxbridge, at the age of 78. Up to his retirement from business in 1889, he was well known as a manufacturer in Uxbridge and Nasonville, R. I.

—S. K. Armstrong, York, S. C. died on Monday, Oct. 4th. His death was caused by the announcement of a fire in his mill.

Alizarine Black

(PATENTED)

Distinguished from all other blacks by the acid test . . .

It is an acknowledged fact that woolen goods for men's wear of American manufacture, due to the more general use of Alizarine Dyes (including the Alizarine Black), are faster in color and therefore give better service to the public than the foreign goods. This is of special importance in view of the fact that our climate with the clear skies and bright sunshine is more trying to colors than in England, Germany or France

Wm. Pickhardt & Kuttroff

NEW YORK

Mr Armstrong was not only a manufacturer, but one of the wealthiest cotton planters in the county. He was a member of the State Legislature.

—James F. Cabaniss, overseer of carding at the Rocky Mount Cotton Mills, Rocky Mount, N. C., died Oct. 7th, age 33. The funeral took place in Gastonia, N. C. Oct. 8th.

—George W. Stevens died at Cordova, Ala., Sept. 30th of heart disease. Mr. Stephens was supervising architect of the new Indian Head Cotton Mills at Cordova.

—James Aldred, overseer of the finishing departments of the Eagle & Phenix Mills, Columbus, Ga., died on Oct. 11th at Hotel Vernon.

—Richard J. Sheridan, foreman in the spinning department of E. D. Thayer Jr.'s Valley Falls mill, died of apoplexy on Oct. 11th, age 37.

—George L. D. Newton died Saturday morning, Oct. 16th, at his home in Worcester, after a long and painful illness. He came to Worcester in 1858, and established a wool business under the firm name of Clark & Newton, later Clark, Newton & Benson. He afterward became purchasing agent for several of the principal woolen mills in the vicinity.

—Bernard Dreifoos died suddenly at his residence in Reading, Pa. 716 Penn St., on Friday, Oct 15th, of heart disease, in his 81st year. He erected the first hosiery mill in Reading in 1859, and resided at his present location for forty-three years.

—Israel N. Kibbe of Valley Falls, R. I. a well known cotton mill superintendent, died at his home on Wednesday, Oct. 20th of heart disease.

—John Hunter Hollingsworth, a well known merchant of New York City, died at his home, 118 W. 126th St., on Monday morning, Oct. 11th, age 61. Mr. Hollingsworth has been connected with James Beebe & Co., (afterward James McCreery & Co.) and subsequently became head of the silk and lace department of A. T. Stewart & Co. In 1861 he began business on his own account, as a manufacturer of suits and lace goods, and for the last 20 years has been head of the firm of J. H. Hollingsworth & Co. He leaves a widow, five daughters and one son.

—James B. Lyall, a resident of Lawrence, Mass., for many years, and an overseer in the Lower Pacific Mill, died at his home during the night, Oct. 2nd, probably of heart disease. He was 70 years of age, and had been employed by the Pacific Mill for 30 years.

—Hiram Wilkinson, general manager of the Aiken Knitting Co., Philmont, N. Y. and a prominent citizen of that place, committed suicide recently by hanging himself in his barn.

—Peter Morgan, who has been employed at the Sayles' bleachery, Saylesville, R. I. died Oct. 11th, age 28, after an illness of about two months from quick consumption.

—Randall W. Roberts, travelling representative of the Hadley Thread Co., Holyoke, Mass., dropped dead at Troy, N. Y. of acute Bright's disease, recently.

BUYERS' INDEX

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Architects and Mill Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Automatic Boiler Feeds.
D'Este & Seeley Co, 20 Haverhill St, Boston,

Balling Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

Bandings.
See under Yarns.

Belting.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Danforth Belting Co, 221 Chestnut St, Phila, Pa.
Fell, Geo. & Son, Bolton, England.
New Jersey Car Spring & Rubber Co, Jersey City, N. J.
Popham, H, & Son, East Newark, N. J.
Standard Mill Supply Co, 77 Exchange Pl, Providence, R. I.
Ulmer Leather Co, Norwich, Conn.
See also Mill Supplies.

Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Danforth Belting Co, 221 Chestnut St, Philadelphia, Pa.

Bindings.
See Tapes and Braids.

Bleaching Materials.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Bobbins, Spools, Shuttles, Etc.
Standard Mill Supply Co, 77 Exchange Pl, Providence, R. I.
Woonsocket Shuttle Co, Woonsocket, R. I.

Boiler Compounds.
Imperial Chemical Co, 432 Market St, Phila, Pa.
Lord, G. W, 316 Union St, Phila, Pa.

Boxes, Paper.
Palmer, J. S, 35 Wistar St, Germantown, Pa.

Boxes, Cloth Boards, Etc.
Pearson, J. T, Kensington, Pa.

Braids.
See Tapes and Braids.

Burr Pickers.
Atlas Mfg. Co., Newark, N. J.
Curtis & Marble Machine Co., Worcester, Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

Business and Financial Brokers.
Riggs & Co, 575 Bourse, Philadelphia, Pa.

Card Clothing.
Ashworth, Elijah, Fall River, Mass.
Farnsworth Card Clothing Co., Pittsfield, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

Card Feeds.
Atlas Mfg. Co , Newark, N. J.
Kitson Machine Co, Lowell, Mass.
Tindell, Henry, 15 Grant Ave., Harrison, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Calico Printers' Machinery and Supplies.
New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.
See also Dyeing, Bleaching Machinery, etc.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester, Mass.

Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Chemicals and Apparatus.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Chemist.
Huntington, Dr. H, 159 Front St, New York.

Combs (Wool and Cotton).
Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

Commission Merchants.
Hayes, O. H, & Co, New York.

Copper Print Rollers.
New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.

Copper Work for Dyers.
Brabender, Chas, Sr, Paterson, N. J.
Phillips Co, The Thomas, Providence, R. I.

Cotton Machinery.
Altemus, W. W, & Son, 2816 N 4th St, Phila, Pa.
Ashworth, Elijah, Fall River, Mass.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Kitson Machine Co, Lowell, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.
Mason Machine Works, Taunton, Mass.
Payne, Geo. W, & Co, Pawtucket, R. I
Phillips Co, The Thomas, Providence, R. I.
Saco Water Power Machine Shop, Biddeford, Me.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Townsend, Thomas, 157 Orange St., Providence, R. I.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Cotton Openers and Lappers.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kitson Machine Co, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Damper Regulators.
D'Este & Seeley Co. (Curtis), 20 Haverhill St, Boston, Mass.

Designers.
Fresnel, Gustave, 135 W. 56th St, N. Y.
Hand, F, & Co, Paterson, N. J.

Dryers.
Philadelphia Textile Machinery Co, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.
See Wool and Waste Dusters.

Dyeing, Bleaching and Finishing.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Kensington Dye Works, Kensington, Pa.
Littlewood, G. J., & Sons, Manayunk, Pa.
Warren, W, Thread Works, Westfield, Mass.
Webster Job Dye Works, Webster, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.
Birch Bros., Somerville, Mass.
Butterworth, H. W, & Sons Co, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hopkins, A, & Co, Bridgeton, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Lincoln & Co, 54 Arch St, Hartford, Ct.
Parks & Woolson Machine Co, Springfield, Vt.
Phenix Iron Foundry, Providence, R. I.
Rockwell, W. S. & Co, 26 Cortlandt St, N. Y.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Woonsocket Machine & Press Co, Woonsocket, R. I.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Dye Sticks.
Haedrich, E. M, 311 1-2 Walnut St, Phila, Pa.

Dyestuffs and Chemicals.
Anchor Color Mfg. Co, 464 Cherry St, New York.
Ashley, T. C, & Co, 145 Milk St, Boston.
Atteaux, F. E, & Co, 172 Purchase St, Boston, Mass.
Bairstow, T, & Co, 211 Pearl St, New York.
Beach & Co, Hartford, Ct.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Corey, S. J, 273 Congress St, Boston.
Dillon & Co, 20 Cedar St., New York.
Farbenfabriken of Elberfeld Co, 77 William St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Hanna-Schoellkopf Co, Philadelphia, Pa.
Harway Dyewood & Extract Mfg. Co, 184 Front St, N. Y.
Holliday, Read, & Sons, 109 William St., New York.
Innis & Co, 120 William St, New York.
Jaeck Bros, J, 62-68 No. 11th St, Brooklyn, N. Y.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 23 Dey St, N. Y.
Johnson, Wm. G, & Co, Uncasville, Conn.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 79 Murray St., N. Y.
Matheson, W. J, & Co, 178 Front St, N. Y.
Merrimac Chemical Co, Boston, Mass.
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Phillips (Moro) Chemical Co, 131 S. 3d St, Phila., Pa.
Pickhardt & Kuttroff, New York.
Roessler & Hasslacher Chemical Co, 73 Pine St, New York.
Sharpless Dye Wood Ext. Co, 22 N. Front St, Phila, Pa.
Stamford Mfg. Co, 157 Maiden Lane, N. Y.
Stone & Ware Co, The, 157 Maiden Lane, N. Y.
Sykes & Street, 85 Water St, N. Y.
Thomas, N. Spencer, Elmira, New York.

Dyers and Finishers.
Boston Finishing Works, Williamstown Mass.
Cranston Worsted Mills (yarns), Bristol R. I.
Firth & Foster Co, Kensington, Pa.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket, R. I.
Oakdale Dye Works, 913 W. York St, Phila, Pa.
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Warren, W, Thread Works, Westfield, Mass.
Webster Job Dye Works, Webster, Mass.

Dyers' Clogs.
Wildman, Jos, & Co, 1908 N. Front St, Phila.

Edgings.
See Tapes, Braids and Edgings.

Electricity.
Beacon Lamp Co, New Brunswick, N. J.
General Electric Co, Schenectady, N. Y.

Electrotyping and Printing.
J. J. Ryder & Co, 210 Westminster St, Providence, R. I.
Whitcomb, H. C, & Co, Boston.

Elevators.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Salem Foundry & Machine Shop, Salem, Mass.

Engineers, Electrical.
Smeallie Bros, Amsterdam, N. Y.

Engineers, Mechanical.
Berlin Iron Bridge Co, E. Berlin, Ct.
Ferguson, John W, Paterson, N. J.
Smeallie Bros, Amsterdam, N. Y.

Engraving on Wood.
Ryder Co, J. J, 210 Westminster St, Providence, R. I.

Express Money Orders and Travelers' Cheques.
American Express Co. offices in every city

Fans—Exhaust and Ventilating.
See Ventilating Apparatus.

Feed Water Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.
Smeallie Bros, Amsterdam, N. Y.

Finishing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Fluted Rolls.
Cohoes Foundry & Machine Co, Cohoes, N. Y
Thurston, A. G, & Son, Box 528, Fall River. Mass.

Fuel Oil Furnaces.
Rockwell, W. S, & Co, 27 Cortland St, N. Y.

Fulling Mills for Woolen Goods.
Hopkins, A, & Co, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.

Gas Singeing Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Rockwell, W. S. & Co, 26 Cortlandt St, N. Y.

Gear Cutting Machine.
Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E, Co, New London, Conn.

Harness Varnish.
D. L. Witmer & Bro, 5th St. and Germantown Ave, Philadelphia.

Heating.
See Ventilating.

Heddles.
Watson, L. S, Mfg. Co, Leicester, Mass.

Hosiery Boards.
Pearson, J. T, Kensington, Pa.

Hose and Rubber Goods.
New Jersey Car Spring & Rubber Co, Jersey City, N. J.

Index.
Burr Index Co, 336 Asylum St, Hartford, Conn.

Ink, Stamping.
Witmer, D. L, & Bro, 5th St. and Germantown Ave, Philadelphia.

Insurance (Employers' Liability).
Employers' Liability Assurance Co, 28 Central St, Boston, Mass.

Knit Goods Edgings, Trimmings, etc.
Byram, F. A, Germantown, Pa.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Fleming & Chapin, 229-231 Church St, Phila, Pa.
Friedberger, Edgings, Germantown, Phila, Pa.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, 2632 Mascher St, Phila.
Weimar Bros, 1817 East York St, Phila Pa.

Knit Goods Finishing Machines, Crochet, Etc.
Champion Sewing Machine Co, 1819 N. 5th St, Phila, Pa.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Von Buchwald, W. C, 120 N. 7th St, Philadelphia, Pa.

Knit Goods Brushers.
Ardrey, S. B, & Sons, Bristol, Pa.
Jones, Lewis, Philadelphia, Pa.

Knitting Machine Cylinders.
Ashman, Stephen A, & Son, 3 Fetter Lane, Phila, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.

Knitting Machinery.
Bohm, Albert, Agt. for R. Stahl, Germany, 114 Nassau St, New York.
Boss Knitting Machine Co, 7th and Walnut Sts, Reading, Pa.
Brinton, H, & Co, 213 Race St, Phila, Pa.
Campbell & Clute, Cohoes, N. Y.
Champion Sewing Machine Co, N. W., cor. American and Diamond Sts, Phila, Pa.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Co, South Bethlehem, Pa.
Hepworth & Co, Lehigh Ave. and Mascher St, Phila, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Keystone Knitting Machine Mfg. Co, 40 No. 7th St, Philadelphia, Pa.
Leighton Machine Co, Manchester, N. H.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Mueller, A, 760 Lexington Ave, Brooklyn, N. Y.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Payne, G. W. & Co, Pawtucket, R. I. (Winders.)
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.
Standard Machine Co., 508 Minor St., Philadelphia, Pa.
Taylor, James, 835 Arch St, Phila, Pa.
Union Raveller Co, Troy, N. Y.

Knitting Needles.
Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Keystone Knitting Machine Mfg. Co, 40 No. 7th St, Philadelphia, Pa.
Lydall, H, & Foulds, Manchester, Conn.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Page Needle Co, Chicopee Falls, Mass.
Stoops, H. R, & Co, 66 No. 4th St, Phila, Pa.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.
Bullock & Crenshaw, 928 Arch St. Phila, Pa.

Lamps, Electric.
Beacon Lamp Co, New Brunswick, N. J.

Looms.
Crompton & Knowles Loom Works, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 23d and Wood Sts, Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St, Phila. Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

Loom Picker Manufacturers.
Crompton & Knowles Loom Works, Worcester, Mass.
Loom Picker Co, Biddeford, Me.

Lubricators.
Dixon, Jos, Crucible Co, Jersey City, N. J.

Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Schofield, Geo. L, 123 N. Front St, Phila,

Machinery Wipers.
American Silk Mfg. Co, 311 Walnut St. Philadelphia, Pa.

Machinists' Tools.
Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E. Co, New London, Conn.

Mails.
Walder, J, Paterson, N. J.

Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 54½ Harmon St, Worcester, Mass.

Mill Builders and Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Brown Bros. & Co, Providence, R I.
Buckley's, Benj. Son, Gun Mill, Paterson. N. J.
Harwood, Geo. S, & Son, 53 State St, Boston.
Hill, Jas, Mfg. Co. Providence, R. I.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
New Jersey Car Spring & Rubber Co, Jersey City, N. J.
Spofford, Wm. S, & Son, 5-11 Culver St, Providence, R. I.
Standard Mill Supply Co, 77 Exchange Pl, Providence, R. I.
Stevenson Bros. & Co, 132 So. 2d St, Philadelphia, Pa.
Thurston, A. G, & Son. Fall River. Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

Napping Machines.
American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Parks & Woolson Machine Co, Springfield. Vt.

Woonsocket Napping Machine Co, Woonsocket, R. I.

Oilless Bearings.

N. American Metalline Co, 62 W. Ave. and 3rd St, Long Island City, N. Y.

Oil Filters.

Burt Mfg. Co, Akron, Ohio.
Robertson, Jas. L, & Sons, 204 Fulton St, New York.

Paints.

American Fire Resisting Paint Co, 17 Broadway, New York.
Devoe & Reynolds, Fulton and Williams St, New York.

Pantagraphs for Mill Engraving.

Johnson, C. A, & Co, 22 Dey St, New York.

Patent Solicitors.

Crosby & Gregory, 34 School St, Boston, Mass.
Wright, Brown & Quinby, 53 State St, Boston, Mass.

Penstocks.

Dalrymple, George, Fair Haven, Vt.

Peroxide of Sodium.

Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.

Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.

Garfield Woolen Co, Garfield, N. J.

Pipe Covering (Magnesia).

Keasby, R. A, 54 Warren St, New York.
Keasby & Mattison Co, Ambler, Pa.
Nightingale, S. C, & Childs, Atlantic Ave, Boston, Mass.

Pneumatic Conveying.

See Ventilating.

Power Transmitting Machinery.

Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
General Electric Co, Schenectady, N. Y.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Kilburn, Lincoln & Co, Fall River, Mass.
Sewing Machine Supplies Co, The, 297 Church St, New York.
Smeallie Bros, Amsterdam, N. Y.

Presses.

Crawford. J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Phillips Co, The Thomas, Providence, R. I.
Pownall, F. H, Iron Works, Jamesburg, N. J.
Sullivan Machinery Co., Claremont, N. H.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Pressure Regulators for Steam and Water.

D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass.

Printers and Embossers.

Novelty Textile Printing Co, 525 W. 24th St, New York.

Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.
Smeallie Bros, Amsterdam, N. Y.

Reed and Harness Manufacturers.

American Supply Co, Providence, R. I.
Brown Bros. & Co, Providence, R. I.
Gowdey, J. A, & Co, Providence, R. I.
John Whitaker Reed Co, 194 Front St., Worcester, Mass.
Loom Picker Co, Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.

Cheney Bros, S. Manchester, Ct.

Roller Skins.

Fell, Geo, & Son, Bolton, England.

Roofing, Gravel, Slag and Composition.

Armitage Mfg. Co, Richmond, Va.
Warren Chemical & Mfg. Co, 45 Fulton St, New York.

Roofing, Paint and Paper.

Armitage Mfg. Co, Richmond, Va.

Roving Cans and Sheet Metal Work for Mills.

Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave. Providence, R. I.
Sullivan Machinery Co, Claremont, N. H.

Saddles, Stirrups and Levers.

Dixon Lubricating Saddle Co, Bristol, R. I.

Sample Cutters.

Gleason, A. H, Rockbottom, Mass.

Schools.

Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Sewing Machines and Supplies.

Birch Bros., Somerville, Mass.
Champion Sewing Machine Co, N. W., cor American and Diamond Sts, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Dinsmore Mfg. Co, Salem, Mass.
Frame, Gibbons, 2nd and Diamond Sts, Phila, Pa.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Stoops, H. R, & Co, 66 No. 4th St, Phila, Pa.

Shearing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.

Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 628, Fall River, Mass.

Shoddies.

See Wool Shoddies.

Shuttles.

See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.

Crompton & Knowles Loom Works, Worcester, Mass.

Singe Plates.

New Bedford Copper Co, New Bedford, Ms.

Sizing.

American Glutrose Co. Penn Mutual Bldg, Phila, Pa.

Slashers.

Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips Co, The Thomas, Providence, R. I.

Soaps.

American Soap & Washolene Co, Cohoes, N. Y.
Holbrook Mfg. Co., 466 Washington St., N. Y.
India Alkali Works, Boston.
Underwood, A. J, 38 South Gate St, Worcester, Mass.

Spindles.

Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.

Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.

Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.

See Cotton Machinery.

Spinning Rings.

Draper Company, Hopedale, Mass.
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinners' Supplies.

Dixon Lubricating Saddle Co, Bristol, R. I.

Spinning Tubes.

Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Steam Boilers.
Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.
Mutual Boiler Insurance Co, 31 Milk St, Boston.

Steam Damper Regulators.
D'Este & Seeley Co, 29 Haverill St, Boston Mass.

Steam Engines.
Brown, C. H, & Co, Fitchburg, Mass.
Hooven (The), Owens & Reutschler Co, Hamilton, O.
Toomey, Frank, 131 N. 3d St, Phila, Pa.

Steam Separators.
D'Este & Seeley Co. (Curtis), 29 Haverill St., Boston.
Robertson, Jas. L, & Sons, 204 Fulton St, New York.

Steam Specialties.
D'Este & Seeley Co, 29 Haverhill St, Boston
Fuel Economizer Co, Matteawan, N. York.
Haines, W. S. C 136 South 4th St, Phila, Pa.,
Robertson, Jas L, & Sons, 204 Fulton St New York.

Steam Traps.
D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass. (return float and expansion).
Haines, W. S. C 136 South 4th St, Phila, Pa.

Tanks, Tubs and Vats.
Brabender, Chas, Sr, Paterson, N. J.
Corcoran, A. J, 11 John St, New York.
Cypress Lumber Co, Apalachicola, Fla.
Hall, Amos H, No. 2nd above Cambria, Phila, Pa.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa

Tapes, Braids and Edgings.
Fleming & Chapin, 229-231 Church St, Phila, Pa.
Friedberger & Co, Germantown, Pa.
Perseverance Mills, 2632-40 Mascher St Phila, Pa.
Weimar Bros, 1817 East York St, Phila, Pa.

Teasels.
Kellogg, Thos. C, 96 Reade St, New York.
Kellogg, Wm, W, Skaneateles, N. Y.
McLaughlin Bros, Skaneateles Falls, N. Y.

Temperature Regulators.
D'Este & Seeley Co, 29 Haverhill St, Boston.
Haines, W. S. C, 136 South 4th St, Phila, Pa.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.
Howard, Geo. C., 1783 Barker St., Phila., Pa

Traveler's Cheques.
American Express Company.

Turbines.
(See Water Wheels.)

Valves.
D'Este & Seeley Co, 29 Haverhill St, Boston Mass.

Ventilating Apparatus.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Massachusetts Fan Company, Room 641, 53 State St, Boston.
New England Heating & Ventilating Co, Providence, R. I.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Washers (Cloth).
Hopkins, A, & Co, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Phillips Co, The Thomas, Providence, R. I.

Watchman's Clock.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nanz & Co, 116 Chambers St, New York.

Water Pressure Regulators.
D'Este & Seeley Co, 29 Haverhill St, Boston.

Water Wheels.
Bradway, C. P, West Stafford, Conn.
Christiana Machine Co, Christiana, Pa.
Humphrey Machine Co, Keene, N. H.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.
Bradway, C. P, W. Stafford, Ct.
Cohoes Foundry & Machine Co, Cohoes N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.
Replogle Governor Works, Akron, Ohio.
Smith, J. Walter, 31 No. Foster St, Worcester, Mass.

Winders. (Hosiery.)
Payne, G. W. & Co, Pawtucket, R. I.
Universal Winding Co, 226 Devonshire St, Boston.

Wool.
Lyon, John H, & Co, 12 Reade St, N. Y.
Webb, Chas. J. & Co, 156 N. Front St. Phila Pa.

Wool Cleaning Compound.
India Alkali Works, Boston.

Wool Combing Machinery.
Crabb, Wm, & Co, Newark, N. J.
Crompton & Knowles Loom Works, Worcester, Mass.
Townsend, Thomas, 157 Orange St, Providence, R. I.

Wool Extracts.
Daly, Jas. E., Paterson, N. J.
Garfield Woolen Co, Garfield, N. J.
Muhlhauser, F, Co, Cleveland, Ohio.
Sullivan, R. T, 155 Federal St, Boston, Mass.

Wool and Waste Dusters.
Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Stillman-Randall Machine Co, Westerly, R. I.

Woolen and Worsted Machinery.
Altemus, W. W, & Co, 2816 N. 4th St, Phila Pa.
Atlas Mfg. Co., Newark, N. J.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Harwood, Geo. S, & Son, 53 State St, Boston.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Kitson Machine Co, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.
Payne, G. W. & Co, Pawtucket, R. I.
Phillips Co The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Woonsocket Machine & Press Co Woonsocket, R. I.

Wool, Hair and Noils.
Fowles & Co, 102 Church St, Phila.
Lyon, John H, & Co, 12 Reade St, N. Y.
Muhlhauser, F, Co, Cleveland, Ohio.
Webb, Chas. J, & Co, 156 N. Front St, Phila Pa.

Wool Shoddies.
Bowers', James, Sons, Ltd, Chester, Pa
Daly, James E, Paterson, N. J.
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.
Muhlhauser, F, Co, Cleveland, Ohio.
Riverdale Woolen Co, Riverdale, Northbridge, Mass.

Wool Sorters and Scourers.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.

Wool Washing, Preparing and Drying Machinery.
Kitson Machine Co, Lowell, Mass.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G, Sons, Graniteville, Mass.

Yarns, Threads, Etc.

Banding.

Moore, C. & Co, 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
White, James F, & Co, N. Y. and Phila, Pa.
Whittier Cotton Mills, Lowell, Mass.

Carpet Yarns.

Fleming & Chapin, 229-231 Church St, Phila, Pa.

Cotton Yarns.

American Spinners' Cotton Yarn Exchange, 226 Devonshire St, Boston.
Catlin & Co, New York and Boston.
Dana Warp Mill, Westbrook, Me.
Eichman & Sternberg, 488 Broadway, N. Y.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Tucker & Cook Mfg. Co, Conway, Mass.

Cotton Warps and Yarns.

American Spinners' Cotton Yarn Exchange, 226 Devonshire St, Boston.
Clark, Wm. Co, Westerly, R. I.
Cohannet Mills, Taunton, Mass.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 229-231 Church St, Phila, Pa
Germantown Spinning Co, Germantown Pa.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Hawes, O. S, & Bro, Fall River, Mass.
Holland & Webb, 487 Broadway, N. Y.
Kerr Thread Co, Fall River, Mass.
King, Alex, & Co, 54 Leonard St, New York City.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Monument Mills, Housatonic, Mass.
Orswell Mills, Fitchburg, Mass.
Montgomery, J. R, Co, Windsor Locks, Ct.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co., 86-88 Franklin St.

Gassed Yarns.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.

Gased Yarns.

Blodgett & Orswell, Pawtucket, R. I.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 229-231 Church St, Phila, Pa.
Kerr Thread Co, Fall River, Mass, and 29 Mercer St, N. Y.
King, Alex, & Co, 54 Leonard St, New York.
Malcolm Mills Co, Frankford, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twines.

Hadley Co, 95 Milk St, Boston, Mass.
Kerr Thread Co, Fall River, Mass, and 29 Mercer St, N. Y.
King, Alex, & Co, 54 Leonard St, New York.
Moore, C, & Co, 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Lowell, Mass.
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

American Spinners' Cotton Yarn Exchange, 226 Devonshire St, Boston.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Clark, Wm. Co, Westerly, R. I.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Clear River Mills, Pascoag, R. I.
Cohannet Mills, Taunton, Mass.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 229-231 Church St, Phila, Pa.
Germantown Spinning Co, Germantown, Pa.
Greene & Daniels Mfg. Co, Pawtucket, R. I
Holland & Webb, 487 Broadway, N. Y.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Kerr Thread Co, Fall River, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Mitchell, James E, & Co, Phila. and Boston.
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Orswell Mills, Fitchburg, Mass.
Porter Bros, 78 Worth St, New York.
Rockwell, E. M, Leominster, Mass.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co, 86-88 Franklin St, N. Y.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co, N. Y.
Warren, W, Thread Works, Lowell, Mass.
Whittier Cotton Mills, Lowell, Mass.

Jute Yarns.

Eichman & Sternberg, 488 Broadway, N. Y.

Mohair Yarns.

Eichman & Sternberg, 488 Broadway, N. Y
Holland & Webb, New York.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills, Bristol, R. I.
Eichman & Sternberg, 488 Broadway, N. Y.
Holland & Webb, New York.
Malcolm Mills Co, 216 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Ramie.

Holland & Webb, New York.

Silk Noils and Yarns.

Skerry, A. T, 47 Leonard St, New York.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 229-231 Church St, Phila, Pa.
Hawes, O. S, & Bro, Fall River, Mass.
Holland & Webb, 487 Broadway, N. Y.
Ryle, Wm, & Co, 94 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Clear River Mills, Pascoag, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Porter Bros, 78 Worth St, New York.
Rockwell, Edward M, Leominster, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Alleghany Worsted Mills, Phila, Pa.
Botany Worsted Mills, Passaic, N. J.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson St, Camden, N. J.
Eichman & Sternberg, 488 Broadway, N. Y.
Herbst & Jones, 21st and Randalm Sts, Philadelphia, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Porter Bros, 78 Worth St, New York.
Sawyer, Manning & Co., 86-88 Franklin St, N. Y.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Alphabetical Index to Advertisements.

	page
Alexander Bros.,	172
Allegheny Worsted Mills,	136
Altemus, W. W. & Son,	17
American Express Co.,	19
American Fire Resisting Paint Co,	20
American Glutrose Co,	17
American Napping Machine Co.,	154
American Silk Mfg. Co,	172
American Soap & Washoline Co.,	—
Am. Spinners' Cotton Yarn Exchange	—
American Supply Co.,	13
Anchor Color Mfg. Co,	145
Ardrey, S. B, & Sons,	168
Armitage Manufacturing Co,	20
Ashley, T. C, & Co,	147
Ashman, Stephen A, & Son,	169
Ashworth, Elijah,	14
Atlas Mfg. Co.,	155
Atteaux, F. E., & Co.,	147
Bamford & Smith,	155
Barker, James,	155
Beach & Co.,	147
Beacon Lamp Co,	24
Becker, Chas. W,	—
Berlin Iron Bridge Co.	Back Cover
Berry, A. Hun,	125
Birch Bros.,	15-151
Bischoff, C., & Co.,	140
Blaisdell, P., & Co.,	175
Bohm, Albert,	168
Boss Knitting Machine Co,	166
Bosson & Lane,	146
Boston Finishing Works,	139
Botany Worsted Mills,	135
Bowers' Jas, Sons, Ltd,	150
Boyer, B. F, & Co,	135
Brabender, Chas., Sr.,	148
Bradway, C. P.	174
Branson Machine Co,	159
Breedon, Wm., & Son,	169
Brinton, H., & Co.,	158
Brophy's Sons, T,	139
Brown Bros. & Co,	15
Brown, C. H, & Co,	173
Brown, W. H,	17
Buckley's Benj., Son,	17
Burr Patent Index Co.,	173
Burt Manufacturing Co,	22
Butterworth H. W. & Sons Co.,	1
Byram, F. A.	170
Campbell, Geo, & Co,	136
Campbell & Clute,	168
Catlin & Co,	131
Champion Sewing Machine Co.,	161
Cheney Bros,	138
Christiana Machine Co,	175
Clark, The William, Co,,	134
Clasgens, The J. & H. Co,	133
Clear River Mills,	130
Cohannet Mills,	135
Cohoes Foundry & Machine Co.,	10
Cooper, Chas,	168
Corcoran, A. J,	150
Corey, S. J.,	146
Corey, Wm., Co.,	169
Crabb, Wm, & Co,	17
Crane Mfg. Co.,	158
Cranston Worsted Mills,	136
Crawford, J. J. & Son,	—
Croft, Howland, Sons & Co,	136
Crompton & Knowles Loom Works,	9
Crosby & Gregory,	21
Curtis & Marble Machine Co.,	154
Cypress Lumber Co,	150
Dalrymple, Geo,	—
Daly, James E.,	150
Dana Warp Mill,	135
Danforth Belting Co.,	172
D'Este & Seeley Co.,	171
Devoe & Reynolds,	—
Dillon & Co,	146

	page.
Dinsmore Mfg. Co,	15
Dixie, Co, The,	156
Dixon, Jos., Crucible Co.,	17
Dixon Lubricating Saddle Co,	19
Draper Company	3
Eco Magneto Clock Co,	167
Eichmann & Sternberg,	133
Elliot & Hall,	16
Employers' Liability Assurance Corporation, Ltd.,	18
Excelsior Knitting Machine Co,	160
Fairmount Machine Co,	10
Farbenfabriken of Elberfeld Company,	142
Farnsworth Card Clothing Co,	14
Fell, Geo., & Son,	14
Ferguson, John W.,	Outside Back cover
Firth & Foster Co,	139
Fitchburg R. R,	169
Fleming & Chapin,	170
Fowles & Co.,	150
Frame, Gibbons,	168
Fresnel, Gustave P,	18
Friedberger, C.	164
Fuel Economizer Co,	151
Furbush, M. A. & Son Machine Co,	22
Garfield Woolen Co.,	—
Gavey School of Design,	156
Geisenheimer & Co,	Outside Back Cover.
General Electric Co.,	172
Germantown Spinning Co.,	130
Gerry, Geo. & Son,	—
Gleason, A. H,	20
Goulds Mfg. Co,	—
Gowdey, J. A, & Co,	16
Granger Foundry & Machine Co.,	Inside Front Cover.
Grant Yarn Co.,	131
Greene & Daniels Mfg. Co.,	134
Greenwood, R., & Bault,	139
Haedrich, E. M,	147
Hadley Co.,	134
Haines, William S,	173
Hall, Amos H.,	150
Hand, Frederic & Co,	18
Hanna-Schoellkopf Co,	145
Hartford Steam Boiler Inspection & Insurance Co.,	175
Harway Dyewood & Extract Co.,	146
Harwood, Geo. S, & Son,	Outside Back Cover.
Hawes, O. S., & Bro.,	131
Hayes, O. H, & Co.,	135
Hepner & Horwitz,	170
Hepworth, John W, & Co,	163
Herbst & Jones,	133
Hill, Jas., Mfg. Co.,	14
Holbrook Mfg. Co.,	156
Holland & Webb,	133
Holliday, Read, & Sons, Ltd,	146
Home Bleach & Dye Works,	139
Hopkins, A, & Co,	151
Hooven, Owens & Rentschler Co,	—
Howard, Geo. C.,	17-158
Howard & Bullough Am. Machine Co.,	7
Hunter, Jas, Machine Co,	152
Huntington, Dr. H,	18
Hunt, Rodney, Machine Co,	154
Hyde, Edward S.,	134
Imperial Chemical Co.,	171
India Alkali Works,	151
Ives, Loyal T.	169
Jaeck, Bros.,	147
Janney, O. S., & Co.,	144
Jefferson, Edw, & Bro.,	125
Jenckes, E., Mfg. Co.,	131-166
Johnson, Chas. A., & Co.,	147
Johnson, Wm. G, & Co,	140
Jones, Lewis	158
Keller, John J., & Co.,	141
Kellogg, Thos. C.,	18
Kellogg, Wm. W.	18
Kennebec Woolen Mills,	156

	page
Kennedy, Thos.	167
Kerr Thread Co.,	133
Keystone Knitting Machine Mfg. Co,	167
Kilburn, Lincoln & Co.,	10
King, Alex'r & Co.,	131
Kitson Machine Co,	5
Klipstein, A, & Co., 145—Outside Back Cover.	
Koechl, Victor, & Co,	140
Krout & Fite Mfg. Co.,	170
Leffel, James, & Co,	174
Leigh, Evan Arthur,	12
Leighton Machine Co.,	160
Lincoln & Co.,	151
Littlewood, G. J, & Sons	138
Lombard Water Wheel Governor Co.,	174
Loom Picker Co., Biddeford,	—
Lord, Geo. W.,	173
Lowell Machine Shop,	2
Lowell Textile School,	126
Lydall, H., & Fouids,	169
Lyon, John H. & Co.,	—
Magnesia, Outside Back Cover	
Malcolm Mills Co.,	136
Manufacturers' Record, Baltimore,	126
Mason Machine Wks.,	6
Massachusetts Fan Co,	148
Matheson, & Co., Wm. J.,	142
Mayo Knitting Machine & Needle Co,	163
McKerrow & Bennett,	10
McLaughlin Bros.,	18
Merrimac Chemical Co,	—
Merrow Machine Co.,	167
Mitchell Jas. E., & Co.,	131
Montgomery, J. R., Co.,	132
Monument Mills,	132
Moore, C., & Co.,	133
Mueller, A,	166
Muhlhauser, The F. Co,	137
Mutual Boiler Insurance Co,	20
Nanz & Co,	167
New Bedford Copper Co.,	148
New England Thread Co,	133
New England Ventilating & Heating Co.,	148
New Jersey Car Spring & Rubber Co,	171
N. Y. & Boston Dyewood Co,	146
North American Metaline Co.,	172
Novelty Textile Printing Co,	138
Nye & Tredick,	158
Oakdale Dye Works,	139
Oakes Mfg. Co,	146
Orswell Mills,	132
Page Needle Co,	169
Palmer, John S.,	170
Parks & Woolson Machine Co.,	153
Pawtucket Dyeing & Bleaching Co.,	139
Paxton & O'Neill,	165
Payne, G. W, & Co,	161
Pearson, J. T.,	168
Pepper Mfg. Co.,	160
Phenix Iron Foundry,	151
Philadelphia Textile Machinery Co.,	11
Philadelphia Textile School,	126
Phillips, The Thomas, Co,	176
Pickhardt & Kuttroff,	112
Popham, H, & Son,	172
Porter Bros & Co,	135
Pownall, F. H, Iron Works,	168
Quilter, James H,	169
Riggs & Co,	125
Riverdale Woolen Co,	150
Robertson, J. L, & Sons,	120
Rockwell, E. M.,	133

	page
Rockwell, W. S, & Co,	18
Roessler & Hasslacher Chemical Co,	143
Ryder, J. J., Co.,	166
Ryle, William, & Co.,	136
Saco Water Power-Machine Shop	12
Salem Foundry & Machine Shop,	16
Sanford Spinning Co.,	128
Sargent's, C. G., Sons,	—
Sawyer, Manning & Co.,	131
Schofield, Geo. L.,	173
Scott & Williams	137
Sewing Machine Supplies Co,	176
Sharpless Dyewood Extract Co.,	147
Shimer, Geo, & Son	134
Skerry, A. T, & Co,	137
Smeallie Bros,	178
Smith, J. Walter,	174
Solis, Andrew J. Jr., & Co.,	134
Spofford, Wm. S, & Son,	14
Stafford & Holt,	165
Stamford Mfg. Co.,	144
Standard Machine Co.,	163
Standard Mill Supply Co,	13
Stearns, A. T, Lumber Co,	149
Stevenson Bros. & Co,	172
Stillman-Randall Machine Co.,	155
Stoddard, Haserick, Richards & Co,	12
Stoops, H. R, & Co,	170
Stone & Ware Co,	146
Sturtevant, B. F. Co., Inside Back Cover	
Sullivan, R. T,	151
Sullivan Machinery Co,	18
Sykes & Street,	144
Taylor, James,	165
Thomas, N. Spencer, Co,	147
Thurston, A. G. & Son,	—
Tindell, Henry,	—
Toomey, Frank,	125
Torrance Mfg. Co ,	—
Townsend, Thos,	16
Treat, Orion,	170
Tucker & CookMfg. Co.,	131
Ulmer Leather Co,	172
Underwood, A. J,	156
Union Raveler Co,	—
Universal Winding Co.,	128
Von Buchwald, W. C,	169
Walcott & Campbell Spinning Co,	135
Walder, J.,	13
Ward & Vandegrift,	17
Wardwell Needle Co.,	169
Warren, W., Thread Works,	130
Warren Chemical Co, Outside Back Cover.	
Watson, L. S, Mfg. Co,	16
Webb, Chas. J. & Co.,	150
Webster Job Dye Works,	138
Weimar Bros,	170
Whitaker, John, Reed Co,	16
Whitcomb, H. C, & Co,	20
White, James F. & Co.,	132
Whitin Machine Works,	4
Whitinsville Spinning Ring Co.,	13
Whiton D. E. Machine Co.,	175
Whittier Cotton Mills,	132
Wildman, Joseph, & Co,	147
Witmer, D. L, & Bro,	167
Woolford, George,	150
Woonsocket Machine & Press Co,	8
Woonsocket Napping Machinery Co,	155
Woonsocket Shuttle Co,	13
Wright, Brown & Quinby,	21

IT PAYS to consult our CATALOG when in need of Oil Extractors Steam Separators, Engine Indicators, Exhaust Heads, Feed Water Heaters, Oil Filters. It is yours for the asking.

JAS. L. ROBERTSON & SONS,

204 Fulton St., New York. 12 Pearl St., Boston.

SITUATIONS WANTED.

The advertisers in the following columns should be addressed in care of TEXTILE WORLD, or inquiries concerning them may be addressed directly to "Information Department, TEXTILE WORLD," as full particulars of each advertiser are on file, and the addresses of suitable agents, superintendents and foremen for every branch of the textile industry will be furnished to manufacturers.

Any subscriber may file his application, and no charge is made until position is secured.

The business of this department is held strictly confidential.

The applications of good overseers in every department, who are in want of positions, are solicited.

Manufacturers are invited to use this department when in need of skilled men; each case will be handled confidentially, with promptness and judgment, and without charge to manufacturers.

A member of the firm is in charge of this department, and gives personal attention to each case.

WOOLEN SUPERINTENDENTS.

1268 **Woolen** superintendent or designer. First-class experience in England and America. A first-class man in every way; age 34; married. Fancy worsteds, cheviots, novelty goods, cassimeres, overcoatings, cloakings, dress goods, piece dyes, worsteds and cheviots.

1305 **Superintendent and Designer** with 20 years' experience in woolen mills, on cassimeres, cheviots, worsteds and cloakings. Is now out of employment. Wants position at once.

1290 **Manufacturer from Scotland** wishes situation as superintendent; thoroughly practical in Scotch tweeds, cheviots, Saxonies, plaids, etc., from wools to finished cloth. Will start with small salary.

1255 **Felts.** The advertiser has a thorough, practical knowledge of all the details connected with the manufacture of paper makers' felts and jackets; especially adapted for fast running machines; good reason why he is now in the market; recommended by past employers.

1250 **Superintendent,** or would accept a position as designer in a good woolen mill. Understands fancy cassimeres, cloakings, dress goods, kerseys, unions and worsteds. Can produce the Jacquard effect on an ordinary cotton, Knowles loom. Refers to good mills.

1239 **A man who understands the** manufacturing of woolens in all the details, is open for an offer. Is an experienced manager, and is at present in charge of a mill that is being run at a profit.

1227 **A Superintendent** with a thorough practical training in all the departments of a woolen mill making worsted cassimeres, dress goods, cloakings, overcoatings, robes, blankets, shawls, etc. Has a thorough knowledge of designing and has held position in first class mill, to which he can refer.

1231 **Manufacturer.** One who has had a thorough experience in the management of a mill of his own, and who can show proof as to his ability, is now in the market for a position as superintendent or assistant superintendent with any good company. Age 40; married.

1159 **Woolen Superintendent.** A first class man on carriage robes, furniture plush, bed and horse blankets. Has excellent references. Has held present position as superintendent for several years; good reasons for desiring a change. Age 39; married.

1222 **Superintendent, Designer and** Weaver. Wants a position in woolen or worsted mill. Understands the work thoroughly, on a great variety of goods.

1318 **Woolen Superintendent and** designer. Young Scotchman. Age 24. With thorough training in Scotland and Germany; has also held position of superintendent and designer in this country. He has excellent references. Well up on cotton, worsteds, unions, cloakings, fancy all wool cassimeres, and coverts. Would take position as assistant in large mill.

1203 **Superintendent, Woolen,** or superintendent and designer. Age 39; married. Has held a position as superintendent 9 years; 2 years in one mill and 7 in another. Has good references. A good man on meltons, coverts, cassimeres, worsted and kerseys; also serges.

COTTON SUPERINTENDENTS.

1265 **Superintendent** wants position as superintendent of cotton cloth mill. Has had charge of each department in the mill; aged 28 years; married.

1266 **Cotton** superintendent wants position. Out on account of mill shutting down. Understands fancy and plain cottons, white and colored. Has a first-class record.

1267 **Cotton** superintendent or carder. Prints, sheetings, ginghams, fine and coarse, white and colored. Nearly all kinds of machinery. References all right. Age 47; married.

1269 **Cotton** superintendent, carder, spinner and dresser; 43; married. Has held position in some of the best mills; is strictly temperate, and well recommended. Cotton, flannels, ginghams, crochet and Marseilles quilts, etc.

1306 Young American wants position as cotton superintendent. Experience mostly on cotton warps. Has been bookkeeper, overseer of carding and spinning; also superintendent in Massachusetts mills.

1114 **Superintendent and Overseer,** wants position on cotton goods, has had a first-class experience, and can furnish first-class references. Will go anywhere; age 39 and married; salary reasonable; is a first class man on seamless bags.

1108 **Cotton Superintendent** or would accept position as overseer of large mule spinning department. Has good references and a first-class record, and is a thorough mechanic; familiar with all kinds of yarns, especial hosiery and prints; age 40 and married.

WOOLEN CARDERS.

1249 **Carder and Spinner,** woolen, wants position. Familiar with a great variety of goods. 37 and married.

1248 **Carder,** woolen. Age 37 years; married. 10 years with one of the best mills in New England. Dress goods, beavers, blankets, cotton warp hair lines and kerseys.

1307 **Carder** with unusually fine record and very wide experience desires good position in New England, Central or Western States. First class references from past positions. Age 44. Experience on cassimeres, cheviots, dress goods, broad-cloth, repellants and blankets.

1309 **Woolen Carder.** 21 years' experience in charge at first-class mills. Has worked on fancy cassimeres, cheviots, meltons and kerseys. Age 45; married. At present out of work.

1230 **Superintendent or Carder and** spinner wants position in woolen mill. Age 30; married. Can take position at once. Familiar with jeans, cassimeres, flannels, knit goods and shoddies.

1233 **Felt** Overseer of Carding. A good man on felt or woolen goods. Aged 35; married. Can refer to past employers.

1321 **Boss Carder.** Over 30 years' experience in woolen mills. American. Will except second hand position in large mill. Well up on dress goods, broadcloths, flannels, kerseys, etc. Has best references.

1314 **Woolen Carder.** American. Age 30. Married. At present employed. Experience on beavers, cassimeres, cheviots, dress goods. Well spoken of by former employers. A first class man for a small mill.

COTTON CARDERS.

1291 **Overseer of Carding and Spinning.** Would like to change from present position to something better. Familiar with Davis & Furber cards and mules, Cleveland cards, Johnson & Bassett mules. Excellent references. Has been superintendent in several mills. Could also take position as assistant superintendent of hosiery mill.

1277 Young Frenchman, with wide experience and good references, wants position as boss carder. Age 38; married.

1138 Second hand of cotton carding wants position. Has had a good experience in that position. References.

1260 **Young Man** who has worked up through carding rooms of some of the best mills in New England, wants position as overseer in New England or Middle States. Age 27. Not married.

1238 **Second** hand of cotton carding. 37; married. Open for engagement.

1315 **Cotton Carder.** Over 20 years' experience as overseer in first class mills. At present employed. Well up on prints and light and heavy sheetings. Knows American and English cards, and speeders. Best references.

1320 **Cotton Carder.** 12 years' experience as overseer in first class mills. Can refer to well known mill men. Age 39. Married.

WOOLEN SPINNERS.

1299 Woolen Spinner who has had experience as second-hand would like a position as boss spinner. Would accept small salary to start. Has worked on cloakings, dress goods and Scotch tweeds in New England mill.

1287 **Young Man** wants position as boss spinner. Experience in first-class mills on cassimeres, kerseys, cheviots, satinets; knows Davis & Furber, Paul and Johnson & Bassett machines. Age 29. Wife works in mill.

1195 **Spinner, Woolen.** American; age 31; married. Experienced on yarns from 1 to 7 1-2 run. Refers to past and present employers. Wants position as overseer. Will not go to Southern States, Canada or Connecticut. Is an experienced overseer.

1112 **Overseer of Woolen Spinning** wants position. Has first-class references. Age 37. Wages reasonable. Will accept second hand's position.

1276 **Spinner,** woolen. Wool and shoddy from 1-2 to 10 run, cassimeres, flannels, dress goods, underwear and blankets. Davis & Furber, Furbush & Sons, Johnson & Basset, and Schmidt machinery. Good references.

1204 **Situation wanted** as boss spinner, or second hand and mule fixer on Platt mules. Many years experience on yarns for dress goods in England, and also yarns for fine woolen cloth. 35 years old and married; good references.

1316 **Overseer Worsted Drawing** and spinning. Will accept first class position at $3 or more per day. At present employed in well known and first class mill. Age 42. Married. Best references from former employers.

COTTON SPINNERS.

1284 **Eleven years as Overseer** in first-class gingham mill, with other experience, has fitted this man for good position in charge of ring spinning, spooling and warping. Age 40. French American; married.

1223 **Wants position as Overseer of** spinning or Twisting, or both. Familiar with fine or coarse numbers. Refers to past and present employers.

1272 **Second Hand** of cotton ring spinning wants position in Massachusetts, Rhode Island, Maine or New York. Age 23; married.

1280 **Wanted, situation** as overseer or second hand of mule spinning by a thorough, practical man. Good references from past and present employers. Understands all English makes of mules. Will go South or Canada.

1196 **Mule or Ring** cotton spinner wants position as overseer. Age 36; married; 12 years in one mill; 6 years as mule spinner, 2 years as second hand and 4 years as overseer. Has had a very thorough experience on tickings, shirtings and denims. Used to both English and American make of machines. References are good; can accept position at once.

1243 **Mule** spinner; cotton. Age 36; married. Prefers New York or Massachusetts; references.

WOOLEN WEAVERS.

1008 **Wants boss job in flannel mill.** Northern New England preferred, also a good man for dresser or fixer, has worked on flannels, serges, cheviots, fancy dress goods. Is 34, married.

1216 **Weaving and Dressing.** Man wants position as overseer of weaving or dressing, or both, in some good woolen mill. Has had 16 years' experience. Can pick patterns and figure yarns. Has references.

1253 **Weaver, Designer or Superintendent.** Open for a position. Refers to past and present employers. Aged 47; married. Worsted cloakings, cassimeres and dress goods.

1130 **Overseer of Woolen Weaving** wants position. Would accept 2nd hand's position in a good mill. American; protestant; age 36; single. Good man on Knowles fancy and plain looms, also Davis & Furber. Cassimeres, worsteds, meltons and flannels. Will not go South, West or Pennsylvania.

1273 **Woolen** weaver wants position. Age 35; married. A first class man.

1313 **Woolen Weaver.** First class references, and experience on fancy cassimeres, kerseys, beavers, dress goods, etc. At present not employed, for good reasons. Age 44. Married.

COTTON WEAVERS.

1297 **Overseer of Weaving.** A man of the very best standing desires a permanent position in first-class mill. He has worked in several of the best mills in New England for upwards of twenty years, and can show splendid references. Has worked on sheetings, prints, sateens, fancies, lenos and plaids. Now unemployed.

1242 **Overseer Cotton Weaving.** Familiar with plain cloths, sateens, fancy checks and stripes, box looms and dobbies. References. Age 43; married. One weaver, one twister in family.

1235 **Cotton** man wants position as overseer of cotton weaving. Prints, twills, satins, denims, cheviots, lenoes, etc. Crompton, Knowles, Lowell, Whiting and English looms.

1288 **Overseer of Cotton or Worsted** weaving wants position. Familiar with all kinds of looms; plain or fancy work. Age 45; married.

1281 **Overseer of Weaving.** Englishman; age 36; married. At present employed in good mill. Would like a position paying more than $3.00. Experience on fine ginghams, plain and fancy cotton and worsted dress goods.

1261 **Weaver.** Cotton, woolen, ramie and silk goods. Good experience in first-class mills.

1247 **Elastic** weaver wants position as overseer. Used to cotton web, elastic suspenders, silk neckwear, dress goods and handkerchiefs. 28.

FINISHERS.

1214 **Woolen and Worsted Finisher.** A first class man. One that has had a thorough experience in one of the best mills in New England.

228 **Worsted or Woolen Finisher.** One of the best men in the country. Age 36; married. English. Has had charge of the leading mills in this country. His experience covers woolen and worsted men's wear, also ladies' dress goods, overcoatings, cloaking, etc. Understands the new German finish applicable for dress goods up to eight ounces. By stiffening on the back this finish makes single warp filling goods equal to two-ply.

1322 **Woolen Finisher.** Over 15 years' experience in Canadian and American mills as finisher. Almost all kinds of woolen goods. At present employed but wants position paying $3 per day, or more. Age 33. Married. An unusually skillful finisher.

1041 **Woolen Finisher.** Has had experience on fancy and piece dyed goods, cassmeretes, cheviots, worsteds, kerseys and dress goods. Wants position as overseer or second hand in New England States. Age 26 years. Will work for $2 50 per day.

228 **Is an A1 Woolen Finisher.** Age 36; married. Has been employed in two of the very best mills in New England, and refers to them as to character and ability.

DYERS.

1302 **Young Dyer** wants position as second-hand or overseer in small mill. Has been under good men in well-known mills.

1303 **Dyer** with six years' training in Bradford, England, before coming to this country. Has been in several American and Canadian mills and given best satisfaction. A thoroughly practical and up-to-date dyer. Age 32. At present employed, and would accept only first-class position.

1304 **Wool Dyer.** 16 years' experience, largely in New England mills, and now employed in the South, desires a position in New England mill. American; married. Thorough knowledge of raw wool and shoddy dyeing in acids, fast alizarine colors; also raw cotton in blacks, browns and blues.

1298 **Wool Dyer.** Young man with experience in New England mills on piece dyes, wool, shoddy and rags. Is now out of a position, and will accept a position anywhere except in the South and Canada.

1292 **Woolen Dyer** with experience also in mixes, piece dyes, rags, hosiery, black cotton, waste and shoddy. Has held boss job several years. Age 34; married. Very good references.

Woolen Dyer with experience on fancy cassimeres, cheviots, meltons; strictly temperate; fair pay; references. Age 26; single. Address "Special" care TEXTILE WORLD.

1319 **Boss Dyer.** Wool, cotton, or raw stock. Alizarine colors; shoddy, carpet yarns, straw goods, beavers. Blue-blacks, all kinds of fancy dyeing. Belgian. Age 29. A thorough master of his trade.

1264 **Dyer** on cassimeres, chinchillas, kerseys, frieze, cloakings, piece dyes, raw wool, raw cotton, cotton yarns and plushes; 43; married. Fair pay. References.

MISCELLANEOUS.

1300 **Wool Sorter** with experience in first-class English mill. Thorough knowledge of wool, noils, waste and all kinds of garnetting. Has not been employed in this country, but can give American references as to character.

1301 **Book-keeper and Paymaster.** Young man of the very highest character desires to move away from the Atlantic coast, on account of his health. Best references from his present and former employers.

1283 **Laboratory Chemist** with experience in large mills and supply house desires position. A moderate salary.

1293 **Bookkeeper** with 22 years' experience in woolen and worsted mills; excellent references. Age 50. Wants permanent position with moderate salary.

1282 Foreman Roller Covering and Belts seven years, and four years foreman in large mills. Excellent references. A reliable young man.

1202 **Silk Superintendent** is open for an engagement with a first-class company. Has a thorough knowledge of all the details connected with the manufacturing of silk ribbons and hat bands, from throwing to the finished product. Has held the position of superintendent of a first-class mill for several years. Under 30 years of age, and married. Has the best of references. For any further information address this paper.

1229 **Dresser.** Overseer of woolen dressing. Age 30. Men's wear and dress goods. Good references.

1228 **Shearer.** Wants position as overseer of shearing. Good man on cassimeres, worsteds, unions and cheviots. Age 25; married. References.

1162 **Good Man for Beaming Department.** On heavy sized, plain calicoes and colored cotton goods, twills and sheetings. Will go anywhere. Age 33; married. Good references.

Superintendent of Hosiery Mill. 18 years' experience. Capable of taking entire control of every department in a large mill; just the man for new plant; will go anywhere; South preferred. Age 38. Address B. L. care TEXTILE WORLD.

1312 **Overseer Dresser.** Age 31. Married. Is at present working in a first class mill. Desires to change because of poor health of family. Can furnish first class references. Cassimeres, unions, woolens.

1137 **A Salesman for an Underwear** Mill. Would prefer the account of some large underwear mill exclusively. Salary or commission. Is an experienced salesman and with 9 years practice in the manufacture of knit underwear.

1153 **Comber.** Understands repairing and running combers, speeders and cards. Overseer seven years in one of England's fine mills, on counts ranging from 120s to 150s. Will accept a position as overseer or 2d hand. Refers to responsible parties as to ability and character.

1271 **Engineer.** Position wanted by a young man with a second class license, as engineer or mechanic. Is a reliable man. Age 21.

1259 **Color Designer** or Woolen Superintendent. Age 39. Good, steady reliable man. Refers to past employers.

KNITTERS.

1257 Superintendent of knitting mill wants position; is a finisher and understands every part of the business, including shipping all kinds of goods, fabrics, cotton, worsteds, silks, wool on all kinds of shapes, and flat goods; most all kinds of knitting machinery and finishing machinery; age 32; married; refers to past record.

1274 A man who thoroughly understands the manufacture of hosiery from the fleece to the case, and is a good manager. Desires to correspond with parties wishing to employ such a man.

1310 **Foreman** with large experience in circular rib knitting. Has worked on almost all kinds of machinery. Is at present out of work, because of mill going out of business. Age 25. Excellent references.

1317 **Knitting Overseer.** Wide experience. Age 36. Not married. Has worked on fleece lined underwear, eider downs, stockinet, jerseys, etc. Familiar with spring needle circular machines First class references.

1274 **Hosiery** superintendent wants position; married. Long experience on men's, women's and children's woolen hosiery.

1294 **Knitter or Machinist.** Understands seamless hosiery and latch-needle machines; ribbed hosiery and underwear. Young man; good references.

DESIGNERS.

1275 **Designer** or assistant. Age 25; married. A good man on cotton or worsted fancy dress goods. Jacquard and box looms.

1263 **Assistant** Designer or Assistant Superintendent. Has received a practical mill experience, and is a graduate of the Philadelphia Textile School. Unions, cassimeres, suiting, cloakings. Age 24 years.

1252 **Designer, Weaver or Dresser.** Aged 40 years; married. Familiar with nearly all kinds of men's wear, piece dyes, etc. Refers to past and present employers.

Account Wanted. Gentleman regularly visiting the cloak, clothing and shirt trade in New York, desires to represent some good mill. Best references. Address P 156, care TEXTILE WORLD.

Jacquard Knitter Wanted.

A thoroughly experienced Boss Knitter, familiar with the German Jacquard machine, who has made sweaters, golf hose, skirts, and kindred articles. Must have first class references as to character and ability. To such a pary, good wages will be paid. If the party in question is familiar with various circular golf hose machines, as well as the Lamb machine, so much the better. Address "Jacquard Knitter," care TEXTILE WORLD, Boston, Mass.

FOR SALE, SECOND-HAND MACHINERY.

Double Corliss Engine, cylinder 23x60 in. Single Corliss Engine, cylinder 20x48 in. Singles Corliss Engine, cylinder 16x36 in. Single Corliss Engine, cylinder 12x24 in. 30-40 50-80 and 100 H. P. Automatic Engines.

Large stock of Plain Slide Valve Engines, Boilers, Steam Pumps, Feed Water Heaters, Lathes, Planers, Shapers, Drill Presses, Milling Machines, Electric Motors and Dynamos, and Wood-working Machines. Let me know your wants as my stock is constantly changing. Yours respectfully, FRANK TOOMEY, 131 No. 3rd St., Philadelphia.

EDWARD JEFFERSON & BRO.,

Worsted .·. Machinery,

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PHILADELPHIA, - - PA.

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J. B. Farrar & Sons, Halifax, England,

Buggella Cork Rollers for Spinning and Drawing.

FOR SALE.

The well-known Buena Vista Cassimere Mills, situated in the city of Buena Vista, Rockbridge Co., Virginia, on the lines of the Norfolk & Western and C. & O. RR. Wool and labor cheap. The plant is in perfect running order, and consists of two full and complete sets of machinery of the best American and English makes, for the manufacture of fine and medium cloths, cassimeres, beavers, and fine steam finished face goods. For full particulars address

R. W. WINBORNE.
Buena Vista, Va.

DYESTUFF SALESMAN WANTED.

For Eastern and Middle States. Also young man for laboratory. Address P 154, care TEXTILE WORLD.

For Sale or Lease.

Parties wishing to engage in manufacturing in the South can buy or lease, at low figures, a new one-story brick building 155x75 ft., with picker room, 8 acres of land attached, located in city of Fayetteville, N. C.

Building on line of C. F. & Y. V. Railroad, with switch, and 400 yards from Cape Fear River steamboat landing.

River competition with railroads converging from 5 different directions renders freight rates lower than at any other interior point in the state. Location healthy. Object being to establish an industry, terms unusually liberal. Address

CHAS. HAIGH, Pres.,
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Business and Financial Brokers.

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Sell all kinds of legitimate business, negotiate partnerships, procure special capital, sell stocks and bonds of first-class manufacturing and mineral corporations, and act as trustees and transfer agents. Business transacted in all parts of the Union and Canada.

Those writing us for our terms will kindly state amount involved, as they are governed thereby according to a uniform list of rates.

HERE IT IS!

WHAT? WHY! Just what you have been looking for,

THE GREATEST **Air Mover** on the American Market

The Berry Wheel,

MANUFACTURED BY

A. HUN BERRY, 23 West First St., BOSTON, Mass.

THIS IS NO NEW THING. It has been fully demonstrated during the past ten years that this Wheel has no equal for moving Air (hot or cold), Smoke, Steam, Dust, Gases, Fumes of Acids, or anything that floats in the air. For Drying all kinds of products, Wool, Cotton, Glue, Yarn, Cloth, Hair, Leather, Book and Leather Board, etc.

BY OUR METHOD of applying this Wheel and handling the Air, we are prepared to remodel any make or kind of Dryers, and guarantee to increase their drying capacity from 25 to 50 per cent.

We have no long list of testimonials to offer. Anyone can get them. **THEY COST NOTHING**, but we can with perfect confidence refer you to **any or all** of our customers.

Mill Ventilation
Drying
Removing Steam } ARE OUR SPECIALTIES.

POSITIVELY this Wheel has no **BACK DRAUGHT**, and is the only Wheel that discharges evenly over the whole surface of the Wheel.

THERE'S ONLY ONE.

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Thoroughly practical instruction given on

New Machinery in Every Branch of

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TEXTILE SCHOOL.

FOURTEENTH YEAR.

Instruction given in all branches of the manufacture of

Cotton, Wool and Silk.

Complete modern equipment for

Carding, Spinning, Dyeing, Weaving and Finishing.

Endorsed by leading MANUFACTURERS and EDUCATORS.

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MILL TRADE

IN THE UNITED STATES.

A BOOK OF 360 PAGES OF CONVENIENT SIZE.

COMPRISING COTTON MILLS, WOOLEN MILLS, KNITTING MILLS, SILK MILLS, FLAX, JUTE AND LINEN MILLS, PRINT WORKS, BLEACHERIES, DYEING AND FINISHING ESTABLISHMENTS, ARRANGED ALPHABETICALLY BY NAME OF MILLS AND ALSO GROUPED ACCORDING TO LOCATION. ILLUSTRATED BY SPECIALLY PREPARED TEXTILE MAPS, SHOWING THE LOCATION OF MILL TOWNS AND CITIES.

Detailed information is given about each establishment, viz., the name of the company or firm, names of officers, agent, superintendent, what the mill makes, number sets of cards and combs (if woolen), number of spindles, number of looms, whether steam or water power, whether a dye house or not, who the selling agents are, or if the mill sells direct. In many instances it gives the name of the buyer of raw materials and supplies. To the travelling man, this directory is invaluable, as the maps give the location of the towns where there are mills, so that trips may be planned. The railroad connections are given, and distances may be estimated accurately from the maps.

IT ALSO HAS LISTS OF LARGE BUYERS OF TEXTILE FABRICS FROM FIRST HANDS INCLUDING MANUFACTURERS' SELLING AGENTS AND DRY GOODS COMMISSION MERCHANTS IN PRINCIPAL CITIES; THE MANUFACTURING CLOTHIERS, SUIT AND CLOAK MAKERS, JOBBERS, LARGE RETAILERS BUYING FROM FIRST HANDS. ALSO LISTS OF DEALERS IN RAW MATERIALS IN PRINCIPAL CITIES. BUYERS' INDEX OF TEXTILE MACHINERY AND SUPPLIES.

This directory is supplemented from month to month by the reports in the TEXTILE WORLD, and six months after its publication, a special statistical issue of the TEXTILE WORLD will contain supplementary data accrued in that time.

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Capital Stock, $500,000.

Sanford Spinning Co

FALL RIVER, MASS.

30,000 Spindles. Weekly product, 50,000 pounds 14s to 40s.

NOVELTY COTTON YARNS,

FROM AMERICAN PEELERS AND EGYPTIAN COTTONS.

OUR SPECIALTY: Superior qualities of Hosiery Yarns, Natural Shades of Cottons, and in Colors, Jaegers, Mixes, and Bleached, Hosiery Cops on Long Tubes, Skeins, Tubes, Cones and Lisle Thread Yarns. Furnished in Carded and Combed Qualities in Singles, 2, 3 and 4-plies.

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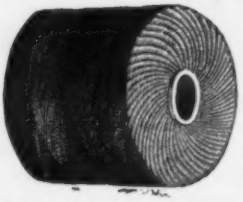


By investigating OUR PROCESS OF WINDING.

HIGHEST AWARD at the World's Fair, Chicago, for new system of winding and also on special machines.

GOLD MEDAL awarded at the Mechanics' Fair Boston, 1895.

In their report the judges say:—"This machine develops an entirely new system of winding, by which threads and twines are prepared in the most compact compass for the market, also shows greater advance in the transfer process than has heretofore been accomplished. This new method of winding subjects the thread to no severe strain, and leaves it in the best condition for use." They also say that they consider the Universal is the greatest single advance shown in any department of our group being *a completed development of a new system*, and thus entitled to the highest award.

F. H. BISHOP, · Manager,

226 Devonshire Street, Boston, Mass.

YARN DEPARTMENT.

Eastern Yarn Market.

Cotton Yarn. There has been a fair demand for yarn and the price of cotton has affected the price of low numbers. The finer counts not only have not declined but have advanced. The combination of yarn spinners is not working well, as it seems to aim to protect the interest of the fine spinners and does not look so well after the spinners of the coarser yarns. Hence it is that the mills not protected, are offering to make concessions on the yarns they are best fitted to make. Many of the knitters who are short on wool, are going to run cotton yarn extensively until the wool market reaches a more stable condition. There has been much yarn sold in 1-8's to 1-11's white cop.

On colored yarns, the fleece lined business continues good, and much yarn has been sold in 1-24's to 1-30's for face, and the heavier numbers for backing.

Egyptian yarn, both in 1-20's and 1-40's combed, is in good demand. Prices on 1-40's and all fine numbers have advanced two cents per pound. Spinners have all the work they can attend to, and expect yarn to advance still further. It is a notable fact that the finer mills, which have been badly affected during the last three to four years, are beginning to regain their old business, and there can be no doubt that with the increased demand combed yarns will reach the old prices again. Spinners have been selling yarn at too low a figure, and the revival of business is getting them in a position to get old prices again. We think, after the first of the year, that prices will be much higher.

We quote:

7/8 white cops	.	.	.	.	.	.	3½ cts.
10s " "	.	.	.	.	.	.	14 cts.
12s " "	.	.	.	.	.	.	14½ cts.
14s " "	.	.	.	.	.	.	15 cts.
16s " "	.	.	.	.	.	.	15½ cts.
18s " "	.	.	.	.	.	.	16½ cts.
20s " "	.	.	.	.	.	.	17 cts.

Silver gray and Jaeger.

10, 11, 12	.	.	.	.	.	.	16 cts.
14	.	.	.	.	.	.	16½ cts.
16	.	.	.	.	.	.	17 cts.
18	.	.	.	.	.	.	17½ cts.
20	.	.	.	.	.	.	18 cts.

Combed Egyptian,		1/20,	23 cts.
"	"	1/30,	29 cts.
"	"	1/40,	33½ cts.
"	"	1/50,	36 cts.

Woolen Yarn. Spinners of woolen yarn are doing but little business at this time, although within the next month orders will be placed more freely. It is going to be difficult for spinners to quote prices on the present wool market, and just how the weavers are going to figure on the coming heavy-weight season is a question. No spinner can make a price which would positively stand 24 hours, and when the demand for heavy weight sets in, the advance on wool will surely reach the importing mark. Wools in Europe have of late advanced from 7 to 10 per cent., and American manufacturers are again buying more Australian wool. Wool wastes of all kinds are scarce, as the factories in Europe are not running and many complaints are coming in from all the manufacturing districts of England, France and Germany. Combers, spinners and weavers are still working under great difficulties, and are crying out for work, and many looms are standing still. Wool is so high that the weavers and spinners cannot afford to buy it and put it into goods. The shortage in Australia, and the American demand, has sent the wool to such a point that America has the market. The Europeans are having a taste of what America suffered during the last 3 or 4 years. We believe that wool finally, will be lower in Europe, but that will not affect prices here, because the duty is so high that

(Continued on page 131.)

Frank E. Patterson, Prest. Oscar W. Wood, Treas

GERMANTOWN SPINNING COMPANY INCORPORATED GERMANTOWN JAN. 9TH 1890

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

Germantown, Philadelphia.

Glazed, Bleached and Dyed

YARNS

Cone Winding.

W. WARREN THREAD WORKS.

WRITE US
WHAT YOU USE,
WE WILL DO THE REST.

WESTFIELD, - MASS.

WOOLEN YARNS.

Single, also Double and Twist
For Weaving Hosiery.

COVERT CLOTH YARNS A SPECIALTY.

Raw Stock and Piece Dyeing.

CLEAR RIVER MILLS,

PASCOAG, R. I.

(Continued from page 129.)

there can be no chance for a reaction until wool has reached a selling point beyond the importing basis.

Spinners are looking forward to a good business, and much fancy dress goods yarn will be sold to replace the worsted yarn which is becoming hard to get, at this time.

Worsted Yarn. Spinners are very busy and the price of worsted yarn is advancing. 2-40's Australian, is now being offered at $1.10 per pound and 2-50's at $1.17½. Dress Goods yarn in 2-36's is in great demand, and prices have advanced from 56 to 80 cents per pound. The advance on heavy-weight goods will undoubtedly reach a point which is just below the importing point, and manufacturers should get much business.

There is much disappointment among many manufacturers at the prices they secured on the light-weight orders. We will venture to say that few, if any, of the manufacturers got much benefit from the advance in the price of yarn. This mistake will not be repeated in the heavy weights, as few spinners will accept orders for next year's delivery. Hence it will be seen that the manufacturers who were not long headed, will make nothing more than an ordinary profit on fabrics of any kind. Weavers are very cautious and will not take orders for next year's delivery. We hear of commission houses trying to buy overcoatings for the whole of the heavy weight season at good prices, which has been declined with thanks.

The heavy weight season, when established, will be a very active one and prices will be fully maintained. Weavers are having a hard time in placing orders for worsted yarn at any price. Spinners have so much business that they do not care to talk for future business. The yarn most in demand at this time is fine Australian yarn for next season. Manufacturers believe that Cheviot yarn has reached its nominal level. We think that most of the orders have been placed for immediate business, and there is a lull

(Continued on page 133.)

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
216 Church St., New York.
206 Chestnut St., Philadelphia.

SAWYER, MANNING & CO.,
YARNS,
36 & 38 Franklin St., NEW YORK

ALEX'R KING & CO.
YARNS.
FINE IMPORTED YARNS A SPECIALTY.
54 Leonard St., New York.

JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelphia, Pa.
51 & 53 Summer St., Boston.
Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

O. S. HAWES & BRO.,
WEAVING and HOSIERY YARNS,
All Plies and Numbers.
Imported Yarns a Specialty
82 and 84 BEDFORD ST., FALL RIVER, MASS.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON WARPS
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON
YARNS 42s and above. AND
FITCHBURG, MASS. WARPS

E. Jenckes Manufacturing Co.
COLORED COTTON YARNS
Cops and Cones.
PAWTUCKET, - R. I.

CAPACITY, 50,000 Spindles. **ORSWELL MILLS** FITCHBURG MASS.

COMBED OR CARDED
COTTON YARNS
In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

SILK LUSTRE COTTON YARNS

In single and two or more plys. This yarn retains its lustre through all usages and is increased in strength twenty to forty per cent.

High Grade **COTTON WARPS** and **NOVELTY YARNS.**

Printers of Cotton, Wool and Worsted Yarns.

The J. R. MONTGOMERY CO.,
. . . . . WINDSOR LOCKS, CONN.

Cotton Yarns AND **WARPS** Of Every Description.

James F. White & Co.
COMMISSION MERCHANTS,
54 an 56 Worth St., NEW YORK.
228 Chestnut St., PHILADELPHIA.

BURLAPS all WIDTHS and WEIGHTS.

MONUMENT MILLS,
Manufacturers of
White, Colored, Fancy and Double and Twist,
COTTON WARPS
4s to 60s.
HOUSATONIC, MASS.

PLAIN AND FANCY PATTERN
Cotton Warps,
WHITE, MIXED AND COLORED.
For SATINETS, BLANKETS, ETC.
WHITTIER COTTON MILLS,
LOWELL, MASS.

Continued from page 131.

in the trade from the "kicking" of buyers to pay advances, and the disinclination on the part of spinners to take orders or quote prices. Weavers can sell cloth at prices which have been already established, but an advance stops trading. The manufacturers know full well that they cannot duplicate the stock that they own, but many, unable to carry the stock, will be forced to sell at old prices, and the buyers are waiting for these weak-kneed concerns. Hosiery manufacturers have all been doing well on worsted goods, and prices have been advanced materially. At the beginning of the season the knitters of hosiery notified customers of a probable advance in yarn. This warning, the buyers ignored, but when the advance of 20 cents per pound came in one jump, and prices were advanced, the buyers were forced to purchase and sacrifice their own profits—so they said. Knitters of all-worsted garments are doing well, and French spun yarn has advanced from 68 to 92 cents per pound, and as we have a shortage of French spinning machinery in this country, the advance, before long, will be more marked than the advance on English machinery.

We quote:

2/40s Australian	$1.07½
2/50s "	1.15
2/20s, 3/8s Blood	.60
2/36s, 1/2 "	.75

Subject to advance.

Philadelphia Yarn Market.

There has been very little weakening in the yarn market the past month. The extraordinary demand has kept mills busy, and behind with their orders, in nearly all sorts of yarns. Some have positively advanced. Some of the coarser numbers have declined somewhat, as there are more spinners able to make them. Spinners, however, are well sold up in all directions. We quote:

WARPS.

20/1	14 to 14½ cts.

(Continued on page 135.)

KERR THREAD CO.
—SPINNERS OF—
Fine Combed Sea Island **COP SINGLES**
All Numbers, 30s to 150s.
Fall River, Mass.

WOOLEN AND MERINO YARNS. Special line for Bicycle and Golf Goods in all shades
For Hosiery, Gloves, Underwear, and all kinds Knit Goods. Cop, Cone and Skeins.
The J. & H. Clasgens Co.
New Richmond, O.

WOOLEN YARNS.
All grades Woolen, Mixed and Merino yarns.
15 SETS CARDS.
EDWARD M. ROCKWELL,
LEOMINSTER, - MASS.

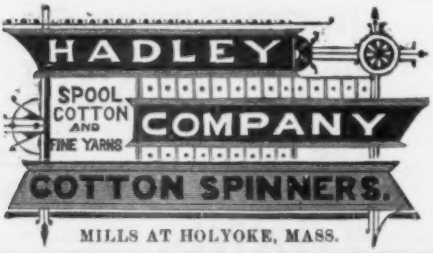
A. HERBST. J. W. JONES.
HERBST & JONES,
Successors to Kershaw Worsted Co.
WORSTED YARN SPINNERS,
21st & Naudain Streets,
PHILADELPHIA.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

EICHMANN & STERNBERG
488-492 Broadway, NEW YORK.
COTTON WOOL SILK **YARNS** For Weaving Knitting or Embroidering.
HARNESS TWINES.

YARNS All Numbers and Qualities.
HOLLAND & WEBB,
478 Broadway, New York.

NEW ENGLAND THREAD CO.
PAWTUCKET, R. I.
Manufacturers of Spool Cotton & Supefine Tapes
Thread and Yarn on Tubes and Cones for the Hosiery trade etc. Thread dressing a specialty, for weaving purposes. Dyers and Bleachers of Threads, Yarns and Tapes.



SPINNERS OF
FINE COTTON YARNS
30s TO 100s.
Gray, Bleached, or Colored. On cop, in skein on spools, cones or tubes.
Fine Cotton Warps, single and two-ply, in chain, etc.
Spool Cotton and Seaming Thread.
95 Milk St., BOSTON.

THE WILLIAM CLARK COMPANY,
WESTERLY, R. I.
Mills equipped with the latest and most improved machinery.
Combed Egyptian from No. 20s to 100s. Combed Sea Island from No. 40s to 200s.
Also 2, 3, 4, 5 ply and 6, 9 and 12 ply cable laid.
Hosiery Yarns on Cops Tubes or In Skeins, Grey, Bleached or Dyed. (Fast Colors.

GREENE & DANIELS MFG. CO.,
COMBED, CARDED AND GASSED
Yarns, Threads, Twines and Chain Warps,
Colored and Bleached Yarns Furnished in any manner desired by the trade. PAWTUCKET, R.I.

WEAVING and HOSIERY YARNS.
We Buy for Cash
WARPS, COPS, TWIST and SOFT SKEINS, Single, Double, 3-ply, 4-ply, etc.
COLORED YARNS for HOSIERY
on Cones, a Specialty.
Correspondence Solicited.
EDWARD S. HYDE, 223 and 225 Chestnut Street, PHILADELPHIA PA.

GEORGE SHIMER & SON,
Spinners of Worsted Yarn for the Weaving and Knitting Trade.
All kinds of Fancy Yarns for the Knitting Trade.
5th and Erie Sts., Camden, N. J.

YARNS
SOLIS - - BOSTON.
179 Devonshire Street.
ANDREW J. SOLIS, Jr. & CO.

A copy of the Textile World's Directory is presented to every paid-up subscriber of the Textile World, with the compliments of the publishers.

(Continued from page 133.)

22/1	14½ cts.
26/1	15½ cts.
12/2	14 to 14½ cts.
14/2	14½ to 15 cts.
16/2	15 to 15½ cts.
14/1	13 to 13½ cts.
16/1	13½ to 14 cts.
20/2	16½ cts.
30/2	19 to 19 ½cts.
30/2 Eastern	19½ to 20 cts.
40/2 Eastern	24 cts.

SKEIN.

26/1	14½ to 15 cts
20/1	14 to 14½ cts.
19/1	14 to 14½ cts.
4s to 10s soft	12½ to 13 cts.
10/2 hard	12½ cts.
12s soft	13 to 13½ cts.
20/2	16 to 16½ cts.
14/2	13½ cts.
30/2	18½ to 19 cts.
26/2	17 to 17½ cts.
40/2	23 to 24 cts.
8/3 carpet	12½ to 12½ cts.
10s double reeled	13 cts.
16/3 slack	14 to 14½ cts.
16/4 medium	14 to 14½ cts.
16/2 slack	14½ cts.

SOUTHERN CONES.

6s to 8s	13½ to 14 cts.
10s	14 cts.
12s	14½ cts.
14s	15 to 15½ cts.
16s	16 cts.
20s	16 to 17 cts.
24s	17 to 18 cts.
26s	17 to 18 cts.

SHUTTLE COPS.

6s to 8s	13½ cts.
10s	13½ to 14 cts.
12s	13½ to 14 cts.
16s	14½ cts.
26s	14½ to 15 cts.
40s Eastern	18½ to 20 cts.

(Continued on page 137.)

O. H. Hayes & Co.,

We will make liberal arrangements with Woolen Manufacturers to handle their productions.

O. H. Hayes & Co.

Walcott & Campbell Spinning Co,
IROQUOIS MILLS.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., N. Y.

B. F. BOYER & CO.,

Successors to GEORGE SHIMER & BOYER,

HOSIERY YARNS,
In Wool, Merino and Worsted.

GOLF YARNS,
In Wool and Worsted. Also carry a full line

BUNDLE YARNS
For the Jobbing Trade.

516 Market St., Philadelphia.
MILLS, CAMDEN, N. J.

PORTER BROTHERS & COMPANY

JOHN PATON, SON & Co. ALLOA TRADE MARK

Commission Merchants,
Trimmings, Buttons and Knit Underwear.
Sole Agents for
John Paton, Son & Co.,
OF ALLOA, SCOTLAND.
Specialties:
SCOTCH MIXTURES
For Sweaters, Golf and Bicycle Hose, Mitts, Gloves, etc.
78 & 80 Worth St., New York.
72-82 Lincoln St., Boston.

BOTANY WORSTED MILLS,

PASSAIC, N. J.

Fine Worsted Yarns,
— AND —
Fine Woolen Yarns
— IN THE —
GREY, COLORS and MIXTURES.

COTTON WARPS
White or Colored.
Toweling and Grain Bags.

Dana Warp Mill,
WESTBROOK, MAINE.

Cohannet Mills,
TAUNTON, MASS.
Spinners of High Grade
HOSIERY YARNS OF EVERY DESCRIPTION.
Selling Agents JAMES E. MITCHELL & Co, Philadelphia and Boston.

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:
Broadway and Jefferson Avenue,
CAMDEN, NEW JERSEY.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

ALL NUMBERS SINGLE AND TWO-PLY,

Worsted YARNS,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes.
Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

The Competition of Foreign Goods

On staple and plain fabrics under present tariff conditions makes it almost impossible to make any money, and the only hope of profit in making Dress Goods, Cloakings and Cassimeres seems to be in using

MOHAIR OR NOVELTY YARNS.

In the United States we are the only manufacturers from raw materials to finished product who make such yarns ONLY.
Perhaps we can be of use to you.

CRANSTON WORSTED MILLS, Bristol, R. I

George Campbell & Co.

Worsted Spinners.

Yarns, both French System and Bradford.

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

21ST STREET AND WASHINGTON AVENUE, PHILADELPHIA.

MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

(Continued from page 135.)

MIXED COLORED CONES.

6s to 8s	14½ to 15 cts.
10s	15 to 15½ cts.
12s	15½ to 16 cts.
14s	16½ cts.

EASTERN COPS.

12s shuttle	14½ cts.
10s to 12s hosiery	14½ to 15 cts.
14s	15 to 15½ cts.
16s	15½ cts.
20s	17 cts.
24s	18½ to 19 cts.

Eastern skein 1-2 ct. above cops.

Eastern cones 3-4 to 1 1-2 cts. above cops.

Egyptian carded, 4 to 5 cts. above white.

Combed yarns, 4 to 5 cts. above carded.

There is a somewhat better demand for woolen, merino and wool spun yarn. Prices are low on wool spun cotton yarn, but have advanced all around with anything that has wool in it.

Worsted,—in good demand. Spinners are very busy; are behind with orders.

—American Merinos are having a great run in South Africa and prices rule high.

—The cotton-spinning industry in China, and especially at Shanghai, bids fair to open up a wide field for foreign capital and enterprise.

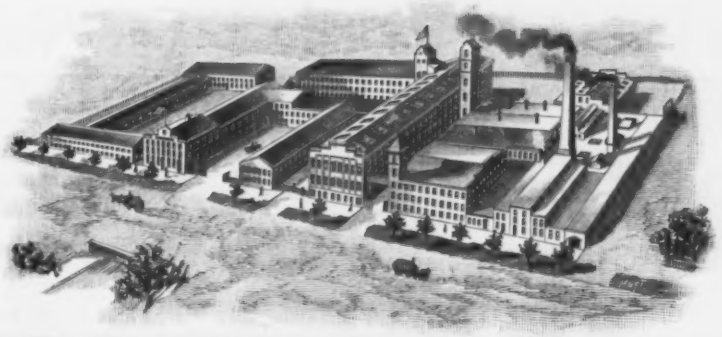
—One of the most popular fabrics of the day is the figured or brocaded leno.

—Some yarns are required to be exceedingly round and level in construction, viz., such as those required in the hosiery trade.

SILK NOILS AND SILK NOIL YARNS
IN WHITE AND COLORS.
MOHAIR LOOPS, KNOTS, AND FANCY YARNS FOR DRESS GOODS AND CLOAKINGS.
A. T. SKERRY & CO., 47 LEONARD ST., NEW YORK.

LARGEST IN THE WORLD. ESTABLISHED IN 1870.

THE F. MUHLHAUSER CO.



FINE SHODDIES, CAPACITY: 10,000,000 lbs. per Annum

Rings, Threads, Botany Yarns, Etc.

BRANCH OFFICES: 143 Federal Street, Boston. 7-9 Grand Street, Troy, N. Y. 34 No. Front Street, Philadelphia, Pa.

CLEVELAND, OHIO.

CHENEY BROTHERS,

SILK MANUFACTURERS.

ALL KINDS OF

Knitting Silks, Ribbons AND Piece Silks,

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, in the Hank, or on Spools or Cones, for Manufacturers' Use. Silk for Special Purposes Made to Order.

MILLS: South Manchester and Hartford, Conn.

SALESROOMS: 477, 479 and 481 Broome Street, NEW YORK.
79 Chauncy Street, BOSTON.
186 Franklin Street, CHICAGO.

WILLIAM RYLE & CO.,

DEALERS IN

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Foreign and domestic

SPUN SILK YARNS AND NOILS

Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., - NEW YORK.

C. J. LITTLEWOOD & SONS, Ltd.

ALBION

DYE and BLEACH WORKS,

MANAYUNK, PA.

DYERS of Cotton, Cotton Yarns, Wool and Raw Stock Generally. **BLEACHERS** of Cotton and Cotton Yarn.

CITY OFFICE: 132 Chestnut Street. Telephone Connection,

PHILADELPHIA. MAIN OFFICE AT THE WORKS.

NOVELTY TEXTILE PRINTING CO., Inc.,

Printers and Embossers of Textile Fabrics.

NOVELTIES IN GOLD EFFECTS, ETC.

447-449 West 14th St., New York.

Webster Job Dye Works.

Dyeing Silk, Worsted, Cotton and Wool in Skeins, Raw Stock, Tops, Slubbing, Rags and Piece Goods. Specialties in Alizarine and Indigo Colors and Fast Black on Cotton. All work warranted.

Charles F. Robinson, Manager, Webster, Mass.

PROVIDENCE DYE WORKS.

~~~Dyers and Finishers,~~~

COTTON YARNS, Suited for HOSIERY and WEAVING Cotton, Woolen and Worsted DRESS GOODS, Woolen and Worsted Mixed CASSIMERES and CLOAKINGS, also Woolen and Worsted Slubbing, COTTON YARN and WARP DYERS and BLEACHERS.

FIRTH & FOSTER CO.,

OFFICES: **Philadelphia, 546 Bourse Building.**
New York Office, Silk Exchange, Broadway and Broome St.
WORKS: **Taylor, Emerald and Adams St., Kensington, Philadelphia, Pa.**

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BLEACHERS, DYERS AND FINISHERS

Of Pure Finish Shirtings, Sheetings, Canton Flannels and Filled Goods. Also Silesias, Satteens, Corset Jeans, Cambrics, Sleeve Linings, Pocketings, Flanneletts, and all descriptions of Dyed Goods.

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Being equipped with the French and other Foreign and Domestic Napping Machines, we are prepared to give any kind of Nap required, including the French FlannelFinish.

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FRANKFORD, - PHILADELPHIA.

Specialists in Cotton Warps and Skein Dyeing.

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PETER B. McMANUS, Proprietor.

Dyers and Bleachers of Cotton Yarns,

PAWTUCKET, R. I.

Pawtucket Dyeing & Bleaching Co.,

BLEACHERS AND DYERS OF

COTTON YARNS AND STOCKINET.

OFFICE WITH BLODGETT & ORSWELL CO., Manufacturers of Glazed Yarns,
28 BAYLEY ST., PAWTUCKET, R. I.

THE SECRET of our popularity is no secret to our customers. Experience has taught them that we give them better work and better service than they can get elsewhere.

T. BROPHY'S SONS,
Dyers of all kinds of Yarn and Cotton Warps,
Jasper Street, above Clearfield Street,
PHILADELPHIA.

FAST FANCY COLORS.

We make a specialty of dyeing **Mode** and **Tan** shade on hosiery and yarns, as also all other fancy shades. **Colors absolutely fast.** For particulars address

OAKDALE DYE WORKS,
913 W. York St., Philadelphia, Pa.
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FAST COLORS

For Wool, Woolen and Cotton Yarn and Piece Goods Dyeing, and for Calico Printing

ALIZARINE RED, PASTE AND POWDER.

Alizarine Blues, Oranges, Browns, Yellows, Maroon, Gray and Black.
Cœruleine, Galleine, Mythylene Grays.
Thionine Blues, Thionine Indigo, Solid Green and
PATENT BLUES (superseding Extracts of Indigo on account of fastness and color bloom) for Wool and Silk, Benzidine and Primuline Colors, Zinc Dust, Aniline Salts and Oil.

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C. BISCHOFF & CO.,

87 and 89 Park Place, New York. Branches, 139 S. Front St., Phila. 104 Broad St., Boston.

Aniline and Alizarine Colors, Dyestuffs, Chemicals,

ANILINE OILS AND SALTS.

LATEST SPECIALTIES.

Cresylblue,	OR pat'd.	For Cotton: absolutely fast to Sunlight.	Thio	Versuvine,	3BB.	One dip for cotton and mixed goods, wool and cotton silk and cotton.
"	BB "		"	Brown,	BB.	
"	RR "		"	Yellow,	R.	
Cresylviolet	"		"	Orange,	G.	

Naphtazine Blue (Pat.)—a fast acid Navy Blue for Wool.

FAST DIRECT BLUES, Pat'd. for Cotton and Mixed Goods. Wool and Cotton, Silk and Cotton.

FAST DIAZOTABLE BLACKS, PAT'D.

Established 1834. H. G. JOHNSON, Proprietor.

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Manufacturers of

DYEWOODS

Logwood Extracts, - - -
Ground and Bolted Camwoods
And other Fancy Woods. -

All Goods Warranted Uniform.

Long Distance Telephone. UNCASVILLE, CONN.

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Aniline Colors,
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FAST COLORS for wool dyeing, one dip cotton colors, novelties and specialties for calico printing.

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JOHN R. GEIGY & CO., Basle, Switzerland.

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IMPORTERS AND
MANUFACTURERS OF

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77 William Street, New York. *68 Batterymarch St., Boston.*
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Alizarine Black-Bayer

(DIAMOND BLACK.)

The Cheapest Fast Black for Wool.

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We offer to supply any required trial quantity at wholesale price. Further instructions and advice . . . . . furnished.

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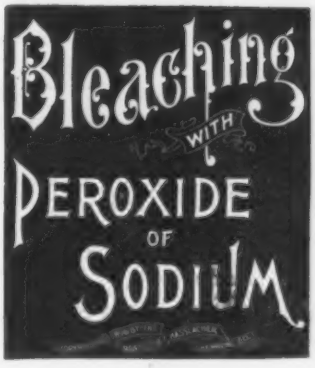

Send samples to be Bleached.

We handle all chemicals used by the bleacher, as Sulphurous Acid, Bisulphite of Soda, Hydrogen-Peroxide, Bleaching Powders, Permanganate, Silicate of Soda, etc.

Wherein we prove its adaptability for all purposes of Bleaching and advantages over Bleaching Powder, Permanganate, Sulphur, Hydrogen-Peroxide, etc.

The Roessler & Hasslacher Chemical Company,

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Boston, 21 Pearl St.
Chicago, 4 N. Clark St.

NEW COLORS

Of the St. Denis Dyestuff and Chemical Company.

BROWN S D P, . . .

New Direct Dyeing Brown for Cotton,

Specially recommended to Hosiery Manufacturers.

SOUDAN BLACKS FOR WOOL,

Dyeing in an Acid Bath. Fast to Light and Milling.

SYKES & STREET,

New York. Boston. Philadelphia.

SOLE U. S. AGENTS.

THE STAMFORD MANUFACTURING CO.

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IMPORTERS OF

INDIGO, CUTCH, GAMBIER, SICILY SUMAC, ANILINES, ETC.

AND DEALERS IN

Dyestuffs, Extracts and Chemicals.

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New York and Boston Dyewood Company,

—— MANUFACTURERS OF ——

DYEWOOD EXTRACTS.

Sole Agents for the United States and Canada for

ACTIEN-GESELLSCHAFT FUR ANILIN-FABRIKATION, BERLIN.

Specialties for Wool, Silk and Cotton.

BENZO PURPURINE B, 4 B, 6 B; BRILLIANT PURPURINE R; BRILLIANT CONGO R, etc.

CHROME FAST BLACK B, a new fast black for wool.

NEW YORK: 85 BEEKMAN ST. PHILADELPHIA: 124 ARCH ST.
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FAST COLORS FOR WOOL.

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American Aniline Colors

FOR **Cotton, Wool and Silk.**

THE HANNA-SCHOELLKOPF CO., Philadelphia.

New York. Established 1865. Philadelphia.

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HAVANA COLORS FOR COTTON.

ALIZARINE AND MAZARINE COLORS for Wool, Yarn and Piece-Goods.

One-Dip Blacks and One-Dip Blues for Mixed Goods.

Lactic Acid, Alizarine Mordant, Archil Liquor, Cudbear, Extract Indigo, Indigotine'

ACID BLACKS.

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MANUFACTURERS OF PURE **LOGWOOD EXTRACTS** SPANISH TOWN, JAMACIA, W. I.

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COLORS, DYESTUFFS, EXTRACTS AND CHEMICALS.

Special Colors and Chemicals for all Purposes.

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Specialties: Acid Blacks for Wool, and One Dip Dyes for Cotton.

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Works: Huddersfield, Eng., Brooklyn, N. Y. Branches: BOSTON, 125 Pearl St., PHILA. 61 N. Front St.

F. G. PAULY, Pres. I. J. MERRITT, Vice Pres. I. J. MERRITT, Jr., Treas

Harway Dyewood & Extract Manufacturing Co.,

MANUFACTURERS OF

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ONE DIP BLACK DYE, CUTCH EXTRACT.

Importers of Indigo, Cutch, Madder, Chemicals, &c.

WORKS: FLUSHING, L. I. 184 Front St., NEW YORK.

BOSSON & LANE,

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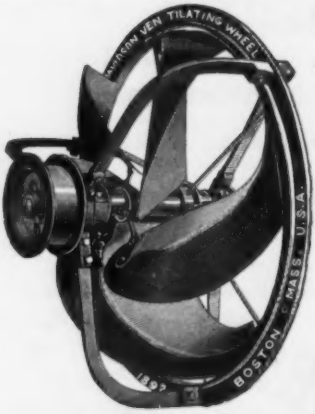

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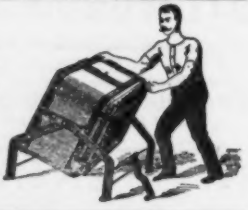

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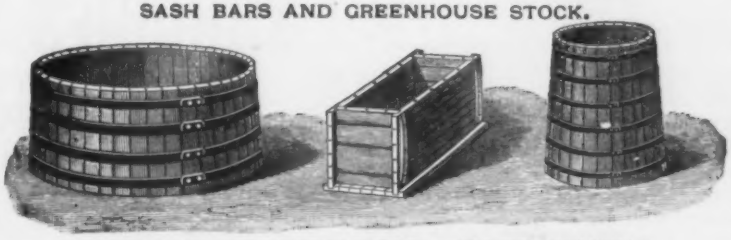

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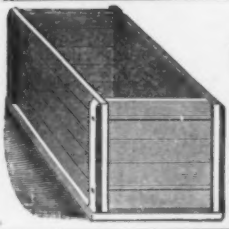

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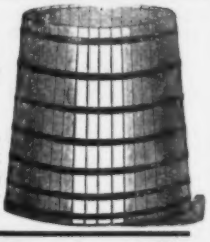

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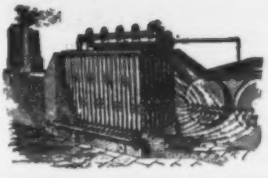

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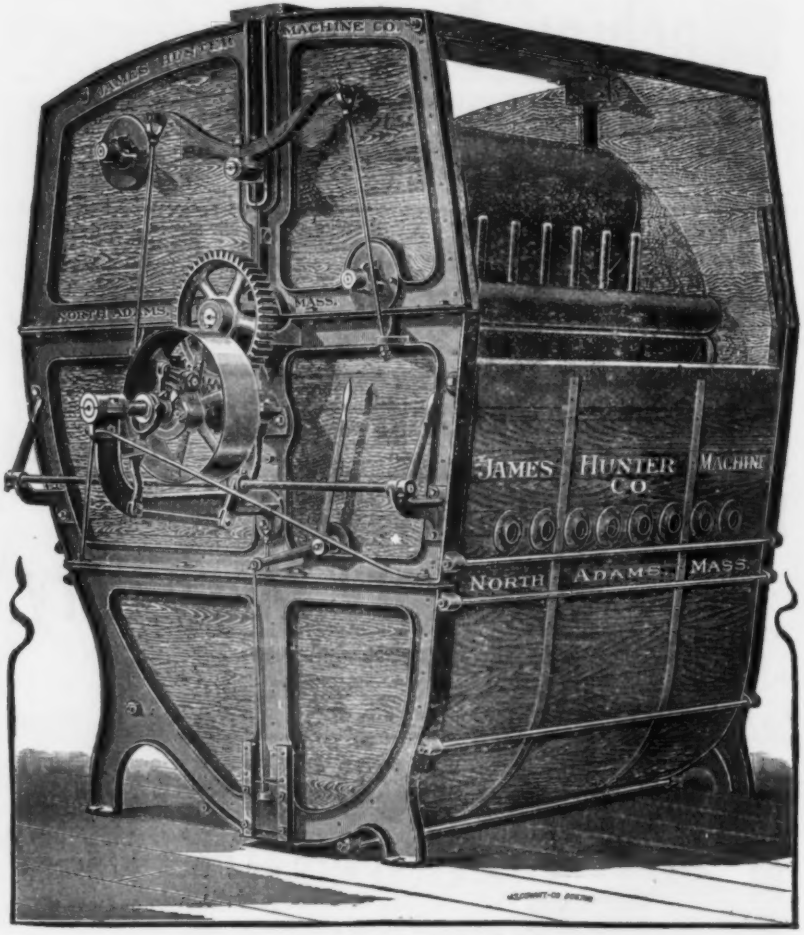

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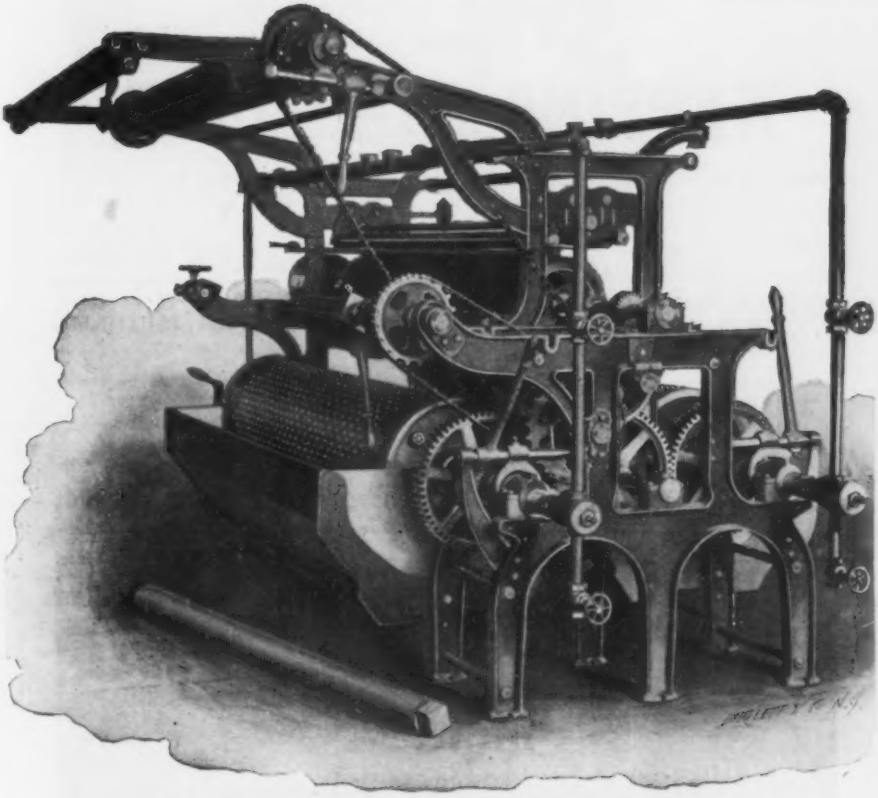

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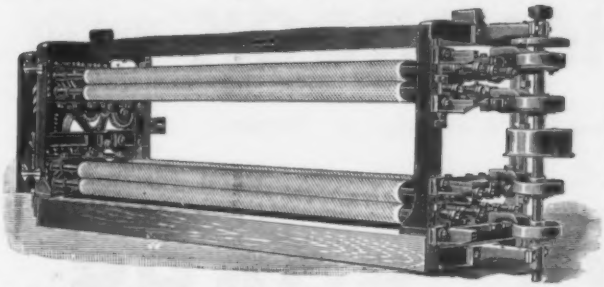

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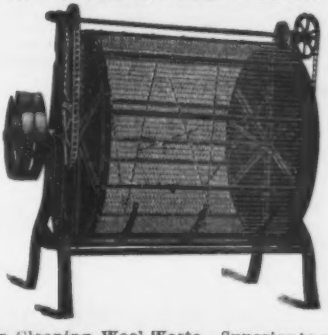

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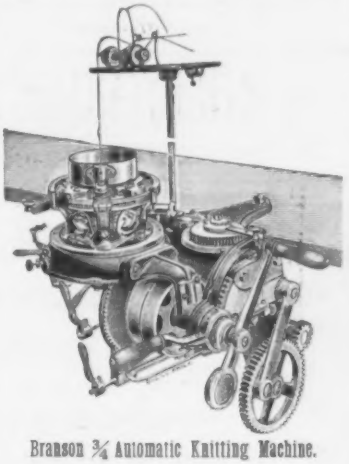

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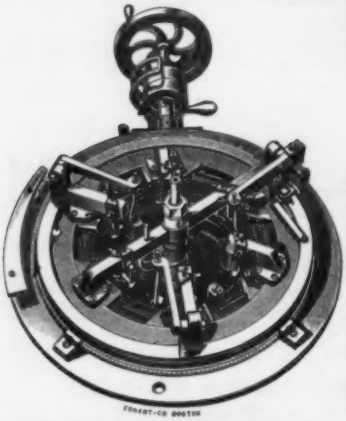

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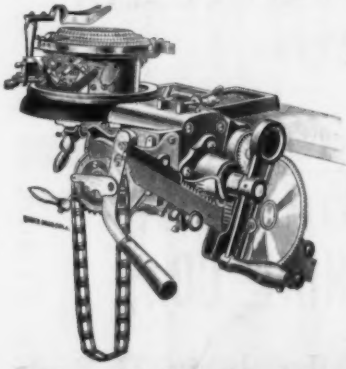

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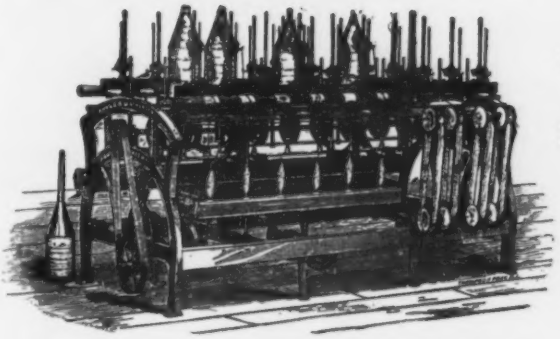

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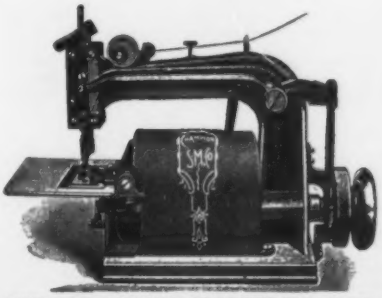

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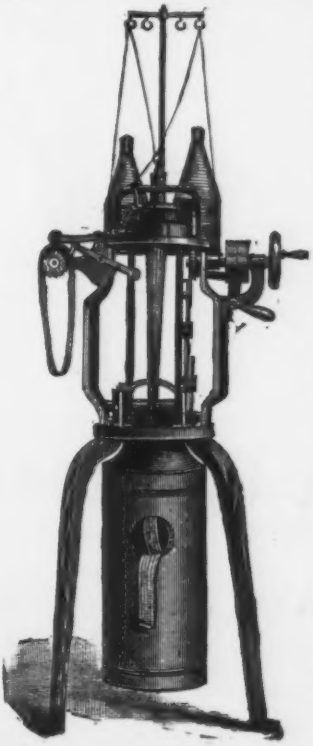

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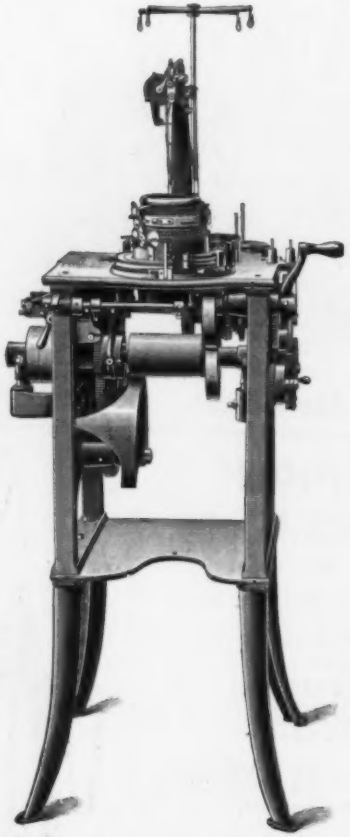

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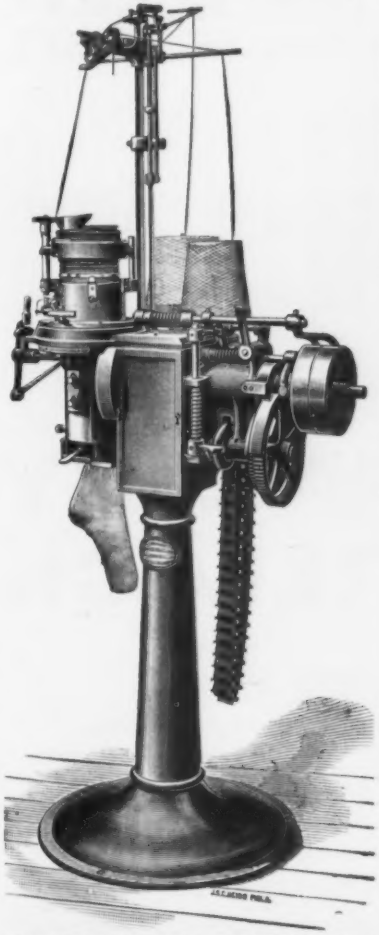

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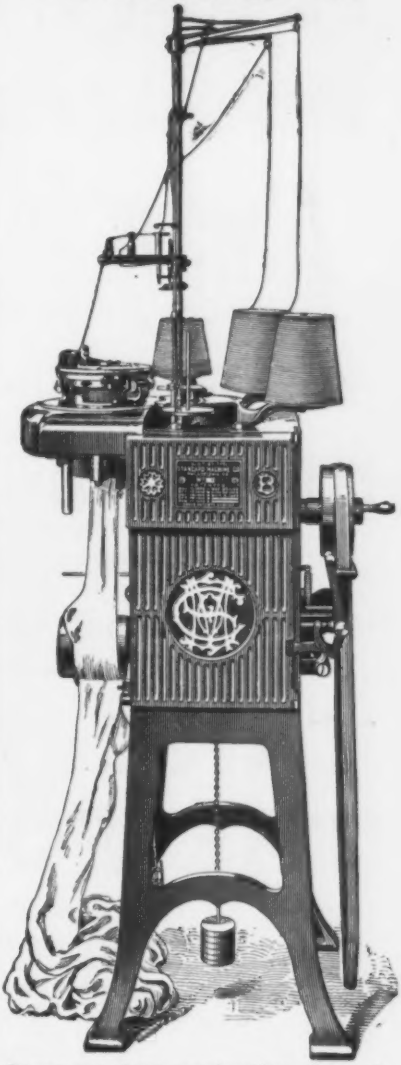

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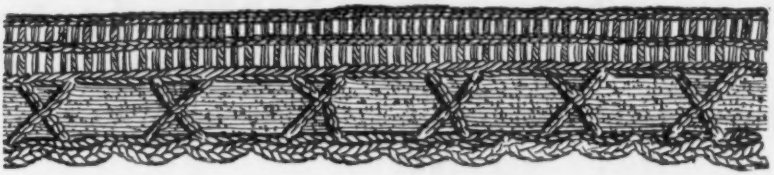

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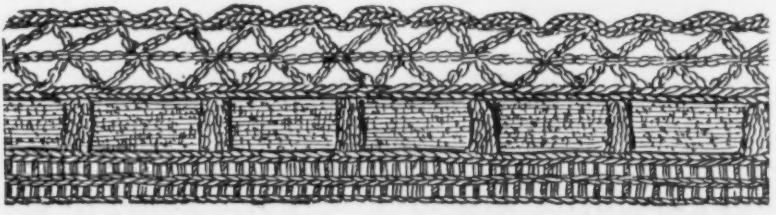

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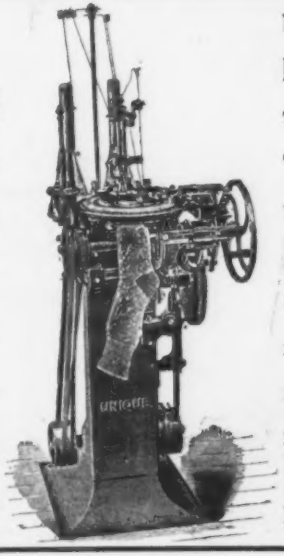

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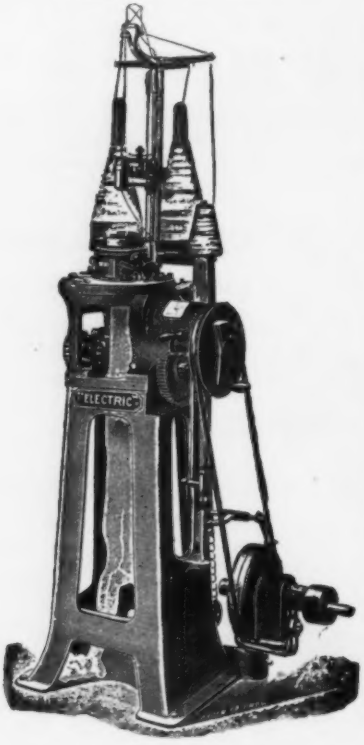

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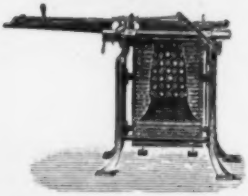

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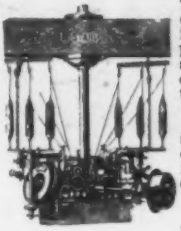

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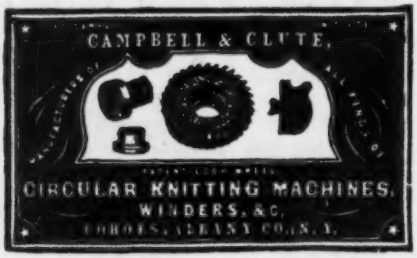

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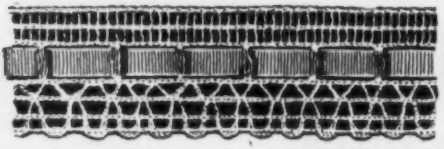
Lace  **Edgings**

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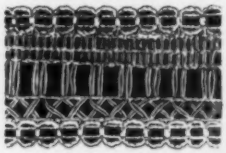

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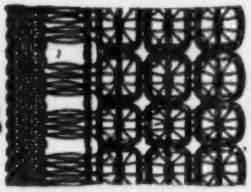

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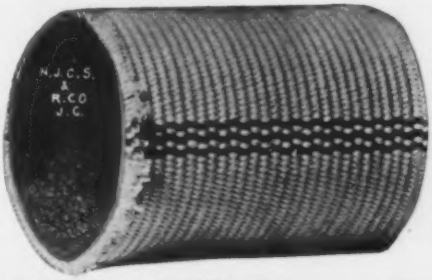

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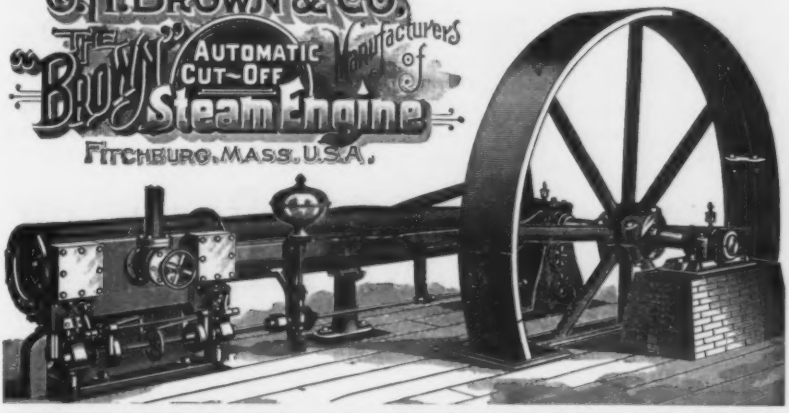

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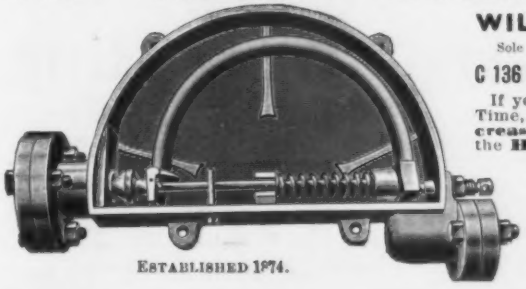

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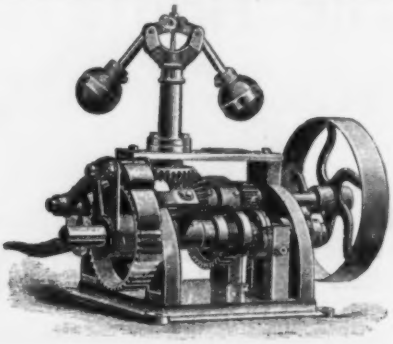

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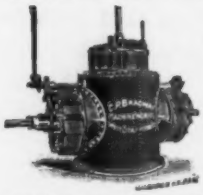

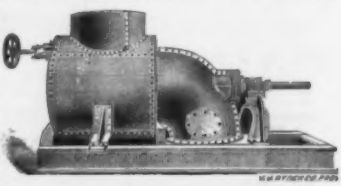

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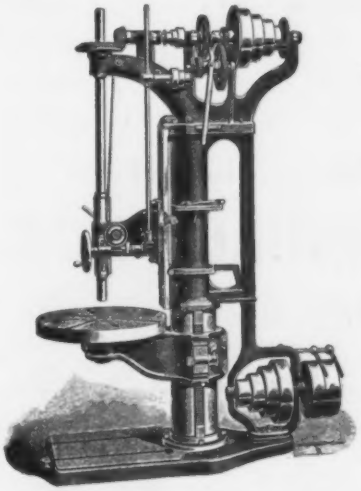

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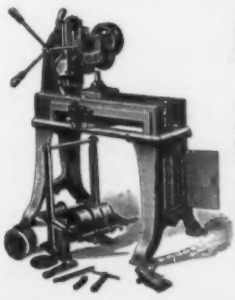

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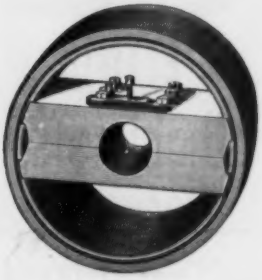

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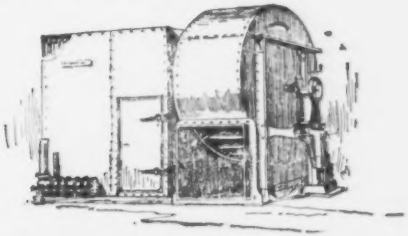

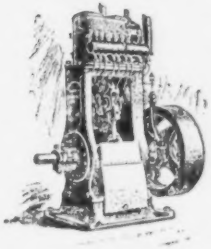

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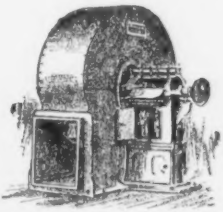

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